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SELECTED PAPERS.

Professor Silliman on the Blow-Pipe.

[From the New York Daily Advertiser.]

Yale College, April 7, 1817.

MR. DWIGHT,

AS a friend to the reputation of our country, in science, as well as to its other important interests, I presume you will be willing to publish the following statement of facts.

Various notices, more or less complete, chiefly copied from English newspapers, are now going the round of the public prints, in this country, stating that "a *new kind of fire*" has been discovered, in England; or, at least, new, and heretofore, unparalleled means of exciting heat, by which, the gems and all the most refractory substances in nature, are immediately melted; and even in various instances, dissipated in vapour, or decomposed into their elements. The first glance at these statements, (which, as regards the effects, I have no doubt, are substantially true,) was sufficient to satisfy me, that the basis of these achievements was laid by an American discovery, made by Mr. Robert Hare, of Philadelphia, in 1801. In December of that year, Mr. Hare communicated to the Chemical Society of Philadelphia, his discovery of a method of burning oxygen and hydrogen gases, in a united stream, so as

to produce a very intense heat. In 1802, he published a detailed memoir on the subject, with an engraving of his apparatus, and he recited the effects of his instrument, some of which, in the degree of heat produced, surpassed any thing before known.—In 1802 and 1803, I was occupied with him in Philadelphia, in prosecuting similar experiments on a more extended scale, and a communication on the subject was made to the Philosophical Society of Philadelphia; the memoir is printed in their transactions; and Mr. Hare's original memoir was re-printed in the Annals of Chemistry, in Paris, and in the Philosophical Magazine, in London. Mr. Murray, in his system of Chemistry, has mentioned Mr. Hare's results in the fusion of several of the earths, &c. and has given him credit for his discovery.

In one instance, while in Europe—in 1806, at a public lecture, I saw some of them exhibited by a celebrated professor, who mentioned Mr. Hare as the reputed author of the invention.

In December 1811, I instituted an extended course of experiments with Mr. Hare's blow-pipe, in which I melted lime and magnesia and a long list of the most refractory minerals, gems and others, the greater part of which had never been melted before, and I supposed that I had decomposed lime, barytes, strontites and magnesia, evolving their metallic bases, which burnt in the air, as fast as produced. I communicated a detailed account of my experiments to the Connecticut Academy of Arts and Sciences, who published it in their transactions for 1812; with their leave, it was communicated to Dr. Bruce's Mineralogical Journal, and it was printed in the 4th No. of that work. Hundreds of my pupils can testify, that Mr. Hare's splendid experiments, and many others performed with his blow-pipe fed by oxygen and hydrogen gases, have been for years past annually exhibited, in my public courses of chemistry, in Yale College; and that the fusion and volatilization of platina, and the combustion of that metal, and of gold and silver, and of many other metals; that the fusion of the earths, of rock crystal, of gun flint, of the corundum gems, and many other very refractory substances, and the production of light beyond the brightness of the sun, have been

familiar experiments, in my laboratory. I have uniformly given Mr. Hare the full credit of the invention, although my researches with his instrument had been pushed farther than his own, and a good many new results added.

It is therefore with no small surprise, that in the Annales de Chimie et de Physique for September 1816 (a French Journal) I found a translation of a very elaborate memoir, from a scientific Journal published at the Royal Institution, in London, in which a full account is given of a very interesting series of experiments performed by means of Mr. Hare's instrument or one on the same principle, but without any notice being taken of Mr. Hare's invention or experiments or of mine; and the whole is exhibited as original. On a comparison of the memoir in question with Mr. Hare's and with my own, I find that very many of the results are identical, and all the new ones are derived directly from Mr. Hare's instrument with the following difference. In Mr. Hare's the two gases were in distinct reservoirs to prevent explosion; they were propelled by the pressure of a column of water, and were made to mingle, just before their exit, at a common orifice. In the English apparatus, the gases are both in one reservoir, and they are propelled by their own elasticity, after condensation by a syringe.

Professor Clark of Cambridge University, the celebrated traveller, is the author of the memoir in question; and we must presume that he was ignorant of what had been done by Mr. Hare and myself, or he would candidly have adverted to the facts.

Measures have been taken to set this matter right in Europe, but, in the meantime, whatever treatment the subject may receive there, it is proper that the American public should know, that Mr. Hare was the inventor of the instrument with which in Europe they are now performing the most brilliant and beautiful experiments, and that there are very few of the results hitherto obtained there, by the use of it, (and the publication of which has there excited great interest,) which were not, several years ago, anticipated here, either by Mr. Hare or by myself.

As I have cited only printed documents, or the testimony of living witnesses, I trust my countrymen will not consider this communication as indelicate or arrogant, but simply a matter of justice to the interests of American science, and especially to Mr. Hare.

BENJAMIN SILLIMAN.

Observations on the Topography of Louisiana. By JABEZ W. HEUSTIS, M. D. late Surgeon in the Army of the United States, &c. &c.

[From Physical Observations, and Medical Tracts and Researches, on the Topography of Louisiana.—New-York, 1817.]

IT is a fact confirmed by the general experience of mankind, that diseases are essentially influenced and diversified in their character and symptoms, by the local circumstances of climate and situation. In all inquiries, therefore, upon the subject of endemic diseases, the physical appearances and condition of the country are entitled to primary consideration. I shall, accordingly, dwell for a little upon the topography of this interesting portion of the union; a country, which, from the richness of its agricultural advantages, claims the pre-eminence over every other portion of the United States; and, in this respect, is certainly entitled to the flattering commendation of M. De Vergennes, who says, "la Louisiane est sans contredit, le plus beau pays de l'univers par la douceur de son climat et son heureuse situation."* Though this advantage of climate and happiness of situation, with respect to the acquisition of wealth, are, in a great degree, counterbalanced by the tax which nature imposes upon the health and lives of the inhabitants.

The state of Louisiana extends from about the 29 to the 33° of N. lat. and lies between 89 and 95° 30′ W. long. from Greenwich. This state is bounded west by the Sabine River, which separates it from the Spanish province of Taxas; north by the Missouri Territory; east by the Missisippi and Pearl Rivers; and south by the Gulf of Mexico. The general dimen-

*Memoir de M. De Vergennes sur la Louisiane.

sions of the whole country of Louisiana extend from the Missisippi to the Pacific Ocean.

The principal rivers of Louisiana are the Missisippi, Red, Ouachitta, Pearl, and Atchafalaya Rivers. Advancing westward, from the Atchafalaya and Plaquamine, we successively find the smaller rivers, Teche, Courtableau, Vermilion, Mermentau, Calcasu, and Sabine, besides other numerous small anastomosing Bayous. On the east side of the Missisippi, between it and Pearl River, are the Amite, which empties its waters into the Bayou Manchac, or Iberville River; the Tickfah, which empties itself into Lake Maurepas; and the Tangipao and Chifuncte, which fall into Lake Pontchartrain. All these latter are rivers of small dimensions, from 40 to 100 miles in length, which take their rise in the Missisippi Territory, and pursue a southwardly course. The Bogue Chito is another river, or branch of the Pearl, which unites with it twenty miles from its junction with the Rigolets, after pursuing a course of 80 miles. The Pearl is a larger and more important river, rising like the other streams west of the Missisippi, in the Missisippi Territory, and falls into the Rigolets, after running a distance of 180 miles. Many streams of considerable size besides the Bogue Chito contribute to augment the Pearl.

The country of Louisiana is separated into two portions, by that great ridge, called the Stony or Rocky Mountains, which gives rise to the Missouri and Columbia Rivers; the latter running west, and discharging its waters into the Pacific Ocean; the former taking a southern and eastern course, and uniting with the Missisippi. Hence it follows, that the country of eastern Louisiana, from the sources of the Missouri, Red, and Arkansas Rivers, &c. to the Gulf of Mexico, is an inclined plane, sloping to the south-east, the direction in which the rivers run. The Stony Mountains are destitute of trees, and have but here and there a scanty covering of herbage. The mountains gradually decline in elevation as they approach the Gulf of Mexico. A few hills of inconsiderable height verge along the western part of this state, about the 31° of north latitude, dividing the waters that flow into the Red River and Calcasu eastward, from those which pursue an opposite course and fall into the Sabine. North of 31° 30′, this ridge of hills runs nearly

equidistant between the Red and Sabine Rivers; becoming irregular and broken, they pursue this direction beyond the state of Louisiana. A chain of hills winds along the south bank of Red River, near the Panis village, giving the waters a southern direction towards the Gulf of Mexico. Another elevated ridge enters this state about the 93° W. long. runs a few miles south, reaches the bank of the Ouachitta in 32° 15′, ranges along that river, until it finally disappears, in 31° 42′ N. lat. and divides the streams which fall into the Red River from those which unite with the Ouachitta. An insulated hill, called Sicily Island, rises from the bank of the Ouachitta, below the mouth of Bœuf River, on the same side. This elevation is about 40 or 50 feet, and continues to preserve that height for some distance, when it gradually sinks into the overflown lands towards the Tensaw River. Below the town of Alexandria, at the rapids of Red River, the hills slope off in opposite directions towards Opelausas and the Ouachitta Rivers. There is an elevated ridge which commences at New Iberia, in the lat. of 30° 3′, and runs through Opelausas and Attacapas, in a north-western direction, being, apparently, a continuation of the mountains that give rise to the Red and Arkansas Rivers. Avoyelles, at the junction of the Red with the Missisippi River, is an elevated tract of prairie, about 16 miles long and three broad, rising to the height of 15 or 20 feet above the general level of the country. These are all the hills worthy of notice in the state of Louisiana; the rest of the country is either a prairie or morass.

The land of this state decreases in fertility as we proceed westward from the alluvial tract of the Missisippi. Immense prairies, or natural meadows, then open to the view, and constitute the greatest portion of Louisiana. These prairies extend in a north-westerly direction, from the Gulf of Mexico to the Stony Mountains of the Missouri, and to the polar regions. Here and there these plains are intersected with strips of timber land, bordering the streams, but more than four-fifths of the country is prairie. The northern portion of this tract, watered by the Missouri, is more fertile and productive than that of the southern, lying in the vicinity of the Gulf of Mexico. In no situation, however, is it well adapted to agriculture; and nature seems to have intended it as a never-failing source of life and

enjoyment to the herbivorous animals of the American Continent. Though possessing a greater degree of fertility, these plains have no inconsiderable resemblance to the desert steppes of Asia, north of the Caspian and Aral Seas. In this wild region, with the exception of a few well watered spots, this arid country presents a dreary expanse, extending from the state of Louisiana to the Rio Gila and the eastern ridge of the Californian Mountains. Though affording an inhospitable residence to man, it, on that very account, gives greater security and protection to those wild animals that shun the society of their common enemy and destroyer. Here range innumerable herds of buffalo and deer, and other animals of the sheep and goat kind, whose constitutions enable them to resist the scorching droughts of this thirsty region.

Such, however, is the condition of animal existence, that few beings subsist solely for their own enjoyment, but for the purpose of affording gratification and comfort to others; more particularly to man, the lord of the universe. Even here in this wild, dreary, and forbidding region, nature has not opposed sufficient obstacles to prevent him from rioting in the carnage of those peaceful tenants of the desert. Leading a wild and vagrant pastoral life, the Hietans, like the Tartars and wandering Arabs, following the herds, have no settled place of abode, but shift and adapt their residence to the migratory movement of these animals, who change their pasture whenever drought and scarcity of water compel them to seek a more favourable situation. The Hietans, who inhabit these regions, have tamed and domesticated the horse, and excel in the management of this noble animal. They are the only aboriginal inhabitants of this continent who have been gallant enough to attempt, and sufficiently skilful to withstand, the shock of cavalry instituted on the principles of European tactics.* In this respect they resemble the Mexican troops of the Presides, according to the account of Baron Humboldt, who observes, "The Mexican troops of the Presides are exposed to continual fatigues. These soldiers are all natives of the northern parts of Mexico. They are mountaineers, of high forms, extremely ro-

* Pike.

bust, accustomed to the frosts of winter, and to the ardour of the sun in summer. Constantly under arms, they pass their lives on horseback. They often march eight or ten days over those desert steppes, without carrying with them any food, except the flour of Indian corn, which they mix with water, as they meet a spring or pond on the road. Well informed officers assert, that it would be difficult to find in Europe a troop more light and active in their movements, or more impetuous in their charge.*"

Here may these outcasts, and strangers from polite society, find a safe retreat from the encroachment of their white countrymen, who are not disposed to envy them the poverty of their enjoyments. Though poor in the estimation of civilized refinement, a serene sky, a temperate climate, and a pure atmosphere, give them the greatest of worldly blessings, the possession of health. An atmosphere uncontaminated with noxious exhalations, fanned with salubrious breezes, and purified by passing over the verdant herbage, diffuses health around them on its balmy zephyrs. Free from anxiety, and strangers to the pangs of disappointed ambition, and unmolested by corroding cares, hope deferred, or blasted expectation, in the possession of health, happiness gilds the unenvied life of nature's humble fondlings: whilst, in the refined societies of civilized life, how often do we see poverty and disease aggravate the misery of existence, and cause the unhappy patient to drain, to the very dregs, the bitter cup of calamity.

But leaving those wilds to the native inhabitants who possess them, and directing our view to the *state* of Louisiana, a different scene presents itself to our observation: the mountains gradually subside into plains, the arid prairie yields in many places to the more fertile tracts of alluvion, the earth is clothed with a richer covering of vegetable growth, and trees of a gigantic size indicate the existence of a more prolific soil. It is here that the Father of Rivers dispenses his fertilizing influence, in the annual inundation of the surrounding country. The spiral pine gives place to the umbellated cypress; the lakes, ponds, and streams are covered with the migratory water fowls,

* Humboldt's Political Essay on New Spain.

that annually and alternately visit the lakes of Canada, and the waters of the Gulf of Mexico.

A considerable portion of the state of Louisiana is unfit for the purposes of cultivation. The south-western part is principally prairie, whilst the southern, and much of that bordering on the river, is an impassable morass. At the mouth of the Sabine, which forms the western boundary of this state, the country exhibits the wildest state of desolation. A line of shell-banks extends along the shores of the lake, into which the Sabine river expands, at the distance of 20 miles from its mouth. These banks are covered with trees of a stunted growth; the surrounding country is a morass, for the extent of near 20 miles above the lake, at which distance trees begin to make their appearance. Throughout the whole extent of the southern boundary of Louisiana, the Gulf of Mexico is unapproachable in any other way than through the water-courses, except at three or four places west of the Atchafalaya, the whole coast being low, swampy, and impassable for some miles into the interior.

Between the smaller rivers which discharge their waters into the Gulf of Mexico, the country is intersected by prairies. Proceeding from the Atchafalaya River westward, we find, in succession, the Prairie Grand Chevreuil, which lies between the Atchafalaya and the Teche, occupying the high ground between the two rivers, beyond the reach of inundation; the Attacapas Prairie, between the Teche and Vermilion Rivers; and Opelousas Prairie, lying upon the west side of the Vermilion River. This prairie is of larger extent than either of the others, taking a direction from S. W. to N. E. and is 70 miles in length and twenty-five in width. We then meet with the Grand Prairie, Prairie Mamou, Prairie Calcasu, which extending from N. E. to S. W. is fifty miles long and twenty wide; and, lastly, the Sabine prairie, between the Calcasu and Sabine Rivers.

The soil of these prairies decreases in fertility as we recede from the Missisippi, becomes dryer, and less subject to inundation. The Attacapas prairie, along the margin of the Vermilion, is of a good quality, and well adapted to the cultivation of cotton, tobacco, indigo, corn, and rice. It is probable that

the sugar cane might also be cultivated to advantage south of the 30° of N. lat. Springs of water are not common in these prairies, though it is easily obtained by digging through the soft earth to the depth of from 20 to 50 feet. The Opelousas Prairie affords a vast and extensive range for cattle. It is principally from this immense meadow that the inhabitants of the country, and the city of New-Orleans, are supplied with beef. This prairie contains more than 1,120,000 acres; upon the calculation that five acres are sufficient for the annual production of a single animal, the number of 224,000 is afforded, which at the average price of ten dollars a head, yields an aggregate amount of 2,120,000 dollars a year. The Prairie Mamou is well adapted, and is now appropriated to the rearing of cattle. To give an idea of the extent to which this branch of husbandry is carried on, we may remark, that three gentlemen in the different provinces of Calcasu, Mamou, and Opelousas, are collectively in the possesion of nearly twenty thousand neat cattle, together with several hundred horses and mules.

A singular appearance is observable in the Prairie Mamou, which is, the existence of a number of little hillocks, resembling vegetable beds in a garden. These little beds are ten or eleven feet wide, and from ten to eighteen inches high. They appear to be the work of some small animal of the mouse or mole kind. These elevations possess more fertility than the other parts of the prairie, as indicated by the larger size and more verdant colour of the herbage, which occasions these meadows to exhibit an agreeably diversified appearance. A great portion of these prairies is sterile, and not well adapted to agricultural purposes. This is more especially the case with those in the western part of the state. Near the Missisippi and along the margin of the Teche River, the land is of a superior quality.

Iron is found in the upper and hilly parts of the state, and might be manufactured on the Little Missouri, and other branches of the Ouachitta, where the ore abounds. Salt plains are very numerous in Louisiana, which will render this necessary article cheap, in proportion as it is easily attainable. Near the sea-coast of the Prairie Calcasu, salt may be obtained in

any quantity. It is now manufactured to a considerable extent at the valuable salt flat on the Sabine River, at the works of Mr. Postlewaite, near Natchitoches, and is thence transported to Natches, New-Orleans, and other parts of the country.

As the Missisippi River is the largest, and of the first importance in the state of Louisiana, and as the physical appearance and phenomena of the country are, in a great degree, to be ascribed to the agency and effects of this voluminous stream, a more particular account of it may not be considered improper on the present occasion. Rising in the most northern parts of the United States, and augmented by the afflux of mighty rivers, it rolls its serpentine stream along the eastern border of Louisiana, and, passing through the lower part of the state, discharges its waters into the Gulf of Mexico.

To enable the reader to form a better idea of the country through which it passes after receiving the Missouri, the following table of the distances of various places on this river is introduced.

	Miles.	Whole Distance.
From the Missouri to St. Louis,	14	14
St. Genevieve,	73	87
Kaskaskias River,	16	103
Grand Chain of Rocks,	75	178
Mouth of the Ohio,	15	193
New-Madrid,	75	268
St. Francis River,	240	508
Arkansas,	107	615
Yazoo,	241	856
Natches,	142	988
Loftus' Heights,	55	1053
Line of demarcation between the United States and Florida,	5	1058
Red River,	10	1068
Baton Rouge,	104	1172
New-Orleans,	136	1308
Fort Balize,	100	1408

From the Great Bend to Cape Girardeau, 157 miles, the Louisiana bank generally continues high, except the interval land on the immediate margin of the river; yet, throughout all this distance, it forms only a moderate elevated ridge, from one to four miles from the river. At Cape Girardeau it begins to assume the appearance of a rough and mountainous country. This continues fifteen miles to the Grand Towers, where the ridge is a perpendicular rocky precipice, 200 feet high. From the Grand Towers to the Grand Chain of Rocks, six miles, the land gradually descends to its general level, which it afterwards preserves without interruption.

From the Grand Chain of Rocks to Fort St. Philip, or Plaquemine, situated 70 miles below New-Orleans, a distance by the river of 1173 miles, the Louisiana bank is but a little higher than the ordinary level of the river. It preserves this height from a quarter of a mile to two miles wide; westward of which, throughout this whole extent, is a swampy country, from 20 to 50 miles in breadth. This bank is inundated every spring, and sometimes in the fall, and the superabundant waters of the river are thus diffused over the whole surface of the swampy low ground of the adjacent country, which, in many places, is so wet and miry, as to render it uninhabitable, and incapable of being cultivated. In all this distance of 1173 miles, there are very few spots on the narrow slip that forms the margin of the river, which afford a site sufficiently elevated for a town or village, that would be at all times safe from inundation. New-Madrid, the only town on the western side below Cape Girardeau, has been once inundated; and the street which was intended to front the river, has been washed away by the current. A considerable portion of the eastern shore is also subject to inundation, except in those situations where it is prevented by the projection of narrow bluffs and high lands. Of these there are 14 between the Ohio River and the Gulf of Mexico. The following table exhibits the names, distances, and breadth of these bluffs on the river, where they are known:

		Miles.	Front.
From the Great Bend to the	Iron Bank,	20	$\frac{1}{4}$
	Chalk Banks,	5	$\frac{1}{4}$
	Upper Chickesaw Bluffs,	154	1
	Second Chickesaw Bluffs,	11	1
	Third Chickesaw Bluffs,	26	1
	Fourth Chickesaw Bluffs,	33	10
	Walnut Hills,	253	
	Grand Gulf,	53	
From the Grand Gulf to the	Petit Gulf,	20	
	Natches,	77	25
	White Cliffs,	20	
	Loftus' Heights,	35	
	Little Cliffs,	103	1
	Baton Rouge,	24	

Throughout this distance, the banks on both sides are universally covered with forest trees. From Fort Plaquemine to the mouth of the Missisippi, a distance of 30 miles, the land upon both sides is a mere morass, or a marshy impassable prairie, skirted with small willows upon the margin of the river.

We meet with many islands in descending the Missisippi. There are 23 between the Great Bend and the Ohio, 33 between the Ohio and the Upper Chickesaw Bluffs, 51 between these and Natches, and 42 between Natches and New-Orleans. Some of these are five or six miles in length; but they are all low, and subject to inundation. They are undergoing continual change in their position and appearance, from the action of the river diminishing them in one part, whilst the deposition of new materials increases them in another. Their formation is effected in the following manner: A tree, in floating down, gets fastened by its branches to the bank or to the bottom of the river, where the water is shoal; against this obstruction, other trees, leaves, brush, and the mud of the river, are lodged, and, by continually accumulating, in a short time form a solid compact mass, in the form of an island; the upper end of which is constantly enlarged by fresh accumulation of those various substances, while the lower part is often undermined and washed away by the current: and in this manner,

many of these islands, by renovation and the accretion of fresh materials, are constantly ascending the stream.

The navigation of this river is not free from danger, and is attended with many difficulties; amongst which *sawyers*, *planters*, *falling banks*, and *bayous*, are principally worthy of notice.

Sawyers are the bodies of trees which, from their roots having become fastened into the bottom of the river, receive, from the pressure of the current, a constant vibratory motion. They frequently disappear from one to 20 minutes, and then raise their trunks with great swiftness, from one to 10 feet above the water. The unfortunate boat against which they may happen to strike, is immediately destroyed. *Sleeping sawyers* approach only within 12 or 15 inches of the surface, and from being concealed, are still more dangerous.

Planters are trees firmly bedded in the soft sandy bottom of the river. Some are perpendicular, others incline up or down the stream. At night they are peculiarly dangerous. The middle of the river is too deep to admit of the fixation of trees in the bottom, so as to be productive of any injury. They are only dangerous upon each side, about one third across the river.

Falling banks are parts of the banks so much undermined by the current, that pieces of them, frequently more than an acre in extent, are constantly falling into the stream. Boats are sometimes destroyed by them. They are also sometimes dashed in pieces on the upper end of the wooded islands, against which they are unavoidably forced by the excessive rapidity of the current.

Besides these dangers, against which it is impossible always to provide, even by day, and which render the navigation very unsafe by night, there is another, during the freshets, more formidable than either. Below Cape Girardeau, in consequence of the lowness of the adjacent country, the force of the inundation from the river has worn outlets or *bayous* in the banks, through which its waters are impelled with great violence. When a boat is passing one of these bayous, great care is necessary, in order to guard against the danger of its being

carried away by the current, and lost in the swamp.* Several of these bayous are properly branches of the main river, conducting a part of its waters to the sea. Bayou Chaffalaia, or Atchafalaya, commences three miles below the mouth of Red River, and pursuing a south-west direction, empties a part of the waters of the Missisippi into the Gulf of Mexico, near Vermilion Bay. In high freshets it is navigable for canoes the whole length. Bayou Manchac, or, as it is sometimes called, the Iberville River, is an outlet on the eastern side, 15 miles below Baton Rouge, which separates Florida from Orleans. It is navigable three months in the year, for boats drawing five feet water. During the greater part of the remaining nine months it is perfectly dry. It conveys a portion of the waters of the Missisippi, during freshets, in an E. S. E. direction, to Lake Maurepas; which is about twelve miles long and eight wide. This is connected, at its eastern end, by a short strait, with Lake Ponchartrain, which is about 35 miles long and 25 wide, and generally from 12 to 14 feet deep. This lake has several connexions with the Bay of Spiritu Santo. Bayou Plaquemine commences eight miles below Manchac, and Bayou Fourche 32 miles below Plaquemine; both are on the western side of the Missisippi, and communicate with the Gulf by several branches. Besides these bayous, which considerably diminish the volume of the river, the main branch of the Missisippi has three mouths, or, as they are called, passes. The *east pass* is 20 miles long, and has 16 feet water over the bar at its mouth. It is the pass principally used; and immediately above the bar, which is very narrow, there is water sufficient for a ship of the line. The *south pass* is 22 miles long, and the *south-west* 25. They both have about 8 or 9 feet water over the bar. A log fort, called Fort Balize, was partially constructed upon a plan of general Wilkinson's, at a great expense, on a little island, at the north side of the east pass. This fort was destroyed by the British in the late war. The block-house and two or three out-houses are still remaining in the vicinity of the ruined fortification. The land upon which they stand is a mere swamp, impassable except along a raised

* *Bayou*, in the Spanish language, expresses the diminutive of bay; but in Louisiana it is frequently applied to a creek or small river.

foot-way of communication. They now serve no other purpose than that of affording a convenient situation for the pilot of the port.

It appears from careful triangular measurement made at the Balize, Fort St. Philip, New-Orleans, and other places, that the medium width of the river is about 800 yards, or rather short of half a mile. The depth, however, compensates for its narrowness, being from 120 to 150 feet deep; and from the bar to the mouth of the Ohio, there is sufficient depth of water to float a ship of the line.

The *Devil's Race Ground* is a difficult and dangerous passage, 107 miles above the River St. Francis. The current is here very rapid, and the river is crowded with planters and sawyers. The *grand chain of rocks* extends in little clusters of islands quite across the river. Many of them are visible when the water is low. The spaces between these rocks are large enough to afford safe navigation to those who are acquainted with their situation. *The grand towers* lie nine miles above. The river here turns to the east. The west bank is a solid perpendicular rock, through which the stream has scooped out a basin 200 or 300 yards in length. In front of this basin stand several perpendicular columns of solid rock, of a circular figure, upwards of 100 feet high, which have hitherto withstood the force of the current. Forty miles above these is the Picket Island Passage, which is so full of snags, sawyers, and planters, as to render the navigation very dangerous at low water. These are all the obstructions below the Great Bend in the Missisippi.*

The usual current of the river is three miles an hour; when the water is very low, it is less; in ordinary freshets it is commonly four, and in the highest it never exceeds five. Ships are liable to much delay in passing from the Balize to New-Orleans. With a good wind they can perform the voyage in less than two days; but when opposed by head winds or becalmed, they are not unfrequently 15 or 20. Another difficulty is the narrowness of the bar, to cross which it is necessary to have a favourable wind, so that vessels are sometimes

* Morse's Geography.

detained nearly a month at the mouth of the river before they can put to sea. With a fair wind, vessels sail from New-Orleans to the Balize in 10 or 12 hours. It often takes from 60 to 80 days to perform a voyage from New-Orleans to Natches. Ships rarely ascend above this place. Boats descend from Natches to New-Orleans in one week, but are about three in returning. The steam boats, which have lately come into use upon the Missisippi, afford much greater ease and rapidity to the navigation. The principal branches of the Missisippi below its junction with the Missouri, are the Ohio from the east, and the Arkansas and Red Rivers from Louisiana.

The French, and a few Spaniards who yet remain, are professedly Catholics. They have but one cathedral. There is, however, a convent of Ursulans, to which is attached about 1000 acres of land, rented out in three plantations. At present the nuns do no exceed 10 or 12 in number, all of whom are French. Formerly there were about the same number of Spanish ladies belonging to the order; but during the period when it was expected that the province would be transferred to the French, they retired to Havanna. Young ladies are received as boarders by the neighbouring nuns, who instruct them in reading, writing, and needle-work. They have always acted with great propriety, and are generally respected and beloved throughout the province. With the assistance of an annual allowance of 600 dollars from the treasury, they always support and educate 12 female orphans.*

According to the census of 1766, the number of inhabitants in Louisiana amounted to 11,496; in 1804, to 35,932; and in 1810, to 97,401; of the latter number, the Territory of Orleans contained 34,311, and the Territory of Louisiana 51,538.

The inhabitants of Louisiana are chiefly the descendants of the French and Canadians. There is a considerable number of Americans and English in New-Orleans. The two German Coasts are peopled by the descendants of settlers from Germany, and a few French mixed with them. The three succeeding settlements up to Baton Rouge contain mostly

* Jefferson.

Acadians, banished from Nova-Scotia by the English, and their descendants. The government of Baton Rouge, especially the east side, which includes all the country between the Iberville and the American line, is composed partly of Acadians, a few French, and a great majority of Americans. On the west side they are mostly Acadians. At Point Coupee and Fausse River they are French and Acadians. A considerable part of the population of the Attacapas and Opelousas is American. Natchitoches, on the Red River, contains but a few Americans; the remainder of the inhabitants are French; but the former are more numerous in the other settlements on the river, viz. Avoyelles, Rapide, and Ouachitta. At Arkansas they are mostly French; and at New-Madrid, Americans. At least two fifths, if not a greater proportion of all the settlers on the west side of the Missisippi, in the Illinois Country, are likewise supposed to be Americans. Below New-Orleans the population is altogether French and the descendants of Frenchmen.

Literature is at a low ebb in Louisiana. There are no colleges in the state, and but one public school, which is at New-Orleans. The masters of this were formerly paid by the King of Spain. They taught the Spanish language only. It has been observed by Mr. Jefferson, that not more than half of the inhabitants are supposed to be able to read and write; and that of those, not more than 200, perhaps, are able to do it well. In general, the learning of the inhabitants does not extend beyond these two arts.

New-Orleans, in lat. 29° 57′ N. long. 90° 8′ W. from Greenwich, and 13° 9′ from Washington, is the only town of any considerable consequence in the whole of Louisiana. It was founded in 1717, and stands on the east bank of the Missisippi, 100 miles from its mouth, 1308 below that of the Missouri, and 1115 below that of the Ohio. It is on the southwest of the Island of Orleans, four miles from Lake Pontchartrain, with which it communicates by the Canal of Carondelet. The town is regularly laid out; the streets cross each other at right angles, and are generally about 40 feet broad. The side-walks are paved with bricks, but the middle of the streets is not paved. This neglect is a material inconvenience to the city, as the natural humidity of the earth renders it very

muddy in the spring of the year, and after falls of rain. It is an inconvenience, however, not easily remedied, as there are no stones within the distance of some hundred miles from the city. The houses of the three principal streets, Levee, Chartres, and Royal streets, near the river, are built chiefly of brick, plastered over with lime, or roughly stuccoed, and the roofs are made of slate or tiles. The back part of the town consists mostly of wooden buildings. New-Orleans extends along the Missisippi in the form of a parallelogram; its length, in the direction of the river, is 1320 yards, and its breadth 700 backwards towards the swamp. In the centre of the town, at the N. W. corner of Chartres and St. Peter's streets, stand the Cathedral, or Church of St. Lewis, and the Town-House, in front of which is an open square covered with grass. The Market-House is a fine brick building, situated on the Levee, nearly in front of the square which lies before the Cathedral, between St. Anne and Du Maine streets. At the south-east end of the town, stands a building occupied as a convent by a number of Ursulan nuns. Besides these public buildings, there are an Hospital, the Barrack-Buildings, a Custom-House, the Orleans, Louisiana, and Planters' Banks, Government-House, the District-Court, and Latrobe's Water-works.

The Levee, before the city, is upwards of 20 feet wide, and in dry weather, when the river is high, affords a pleasant walk; but in the summer and autumn it is rather to be avoided, on account of the offensive odour of the miasmatic exhalations of the corrupting filth left upon the banks after the falling of the water, and accumulated by constant addition from the city.

The city and suburbs of New-Orleans contain about 24,000 inhabitants. The proportion of whites and people of colour is nearly equal. Amongst the whites, the French are most numerous and wealthy. There are a few Spaniards and Portuguese, some Italians, and a number of Indians. From all which, it will readily be supposed that there must be a great diversity and contrast of complexion, language, and manners among the different descriptions and classes of society.

The Indians who reside in the vicinity of the town, are miserable outcasts from the Albania, Tunica, Chittemaches,

and Atacapas tribes. They wear but little clothing, and participate in all the vices of intoxication, riot, and debauchery.

The situation of New-Orleans possesses many and important advantages as a city, from the extensive communication which the rivers afford it with the northern parts of the United States. The Missisippi, and the great rivers connected with it, the Red River, the Arkansas, the Ohio, the Missouri, the Illinois, and their branches, open an extent of inland navigation, of which there is scarcely a parallel on the globe. The difficulty and delay in entering the mouth, and in ascending the river, deprives New-Orlesns of many commercial advantages, which a more easy access would otherwise afford. The easiest and most usual mode for small vessels to transport their merchandise to New-Orleans, is to ascend Lake Pontchartrain to the mouth of Bayou St. John, where the goods are put into boats, carried up the bayou six miles, and through the Canal of Carondelet to the city. This canal is two miles in length, and leads from Lake Pontchartrain, by way of Bayou St. John, to New-Orleans, and is to be extended to the Missisippi. For this purpose 25,000 dollars were appropriated by Congress, in February, 1809.

Forest trees flourish in this state, in great abundance and variety. The following list contains the names of the principal part of the trees which are found in Louisiana:

Acer negundo,	Box Elder,
Acer nigrum,	Black Sugar Maple,
Acer rubrum,	Red Flowering Maple,
Amygdalus Persica,	Peach,
Andromeda racemosa,	
Annona triloba,	Papaw,
Betula lentea,	Black Birch,
Bignonia catalpa,	Catalpa,
Carpinus ostrya,	Iron wood,
Carpinus Americana,	Hornbeam,
Castanea parmila,	Chincapin,
Cerasus Caroliniana,	Laurier Almond,
Cerasus Virginiana,	Wild Cherry,
Citrus aurantium,	Sweet Orange,

Citrus medica,	Seville Orange,
Cornus Florida,	Dogwood,
Cornus Alba,	Swamp Dogwood,
Cupressus disticha,	Cypress,
Diospiros Virginiana,	Persimon,
Fagus Sylvestris,	Beech,
Fraxinus aquatica,	Water ash,
Fraxinus tomentosa,	Red ash,
Gledista monosperma,	Water Locust,
Gledista triacanthos,	Honey Locust,
Ilex opaca,	Holly,
Juglans amara,	Bitternut Hickory,
Juglans cathartica,	Butternut,
Juglans aquatica,	Swamp Hickory,
Juglans laciniosa,	Thick Shell-bark Hickory,
Juglans myristicæformis,	Nutmeg Hickory,*
Juglans olivæformis,	Paccan,†
Juglans nigra,	Black Walnut,
Juglans porcina,	Pignut Hickory,
Juniperus Virginiana,	Red Cedar,
Laurus benzoin,	Spicewood,
Laurus sassafras,	Sassafras,
Laurus Caroliniensis,	Red Bay,
Liquidamber styraciflua,	Sweet Gum,
Liriodendrum tulipifera,	Poplar,
Magnolia glauca,	White Bay,
Magnolia grandifloria,	Large Laurel,
Morus rubra,	Red Mulberry,
Morus scabra,	Spanish Mulberry,
Nyssa aquatica,	Tupelo,
Nyssa sylvatica,	Black Gum,
Pavia lutea,	Buckeye,
Pinus taeda,	Loblolly Pine,

* This tree, first noticed by Michaux, grows plentifully on the rich acclivities of hills in the western part of the Missisippi Territory, and west of the Atchafalaya, wherever the country is broken and fertile.

† The Paccan grows in immense quantities above Natchitoches, on the banks of the Red River, as also upon those of the Trinity, Brasos à Dios and Rio Colorado.

Pinus rigida,	Pitch Pine,
Populus angulata,	Cotton wood,
Platanus occidentalis,	Sycamore,
Quercus alba,	White Oak,
Quercus aquatica,	Water Oak,
Quercus falcata,	Spanish Oak,
Quercus ferruginea,	Black Jack Oak,
Quercus lyrata,	Swamp White Oak,
Quercus macrocarpa,	Overcup Oak,
Quercus obtusiloba,	Post Oak,
Quercus phellos,	Willow Oak,
Quercus rubra,	Red Oak,
Quercus tinctoria,	Black Oak,
Quercus virens,	Live Oak,
Robinia pseudacacia,	Black Locust,
Robinia pumila,	Dwarf Locust,
Robinia bistineau,	Bistineau Locust,
Tilia pubescens,	Downy Linden,
Ulmus Americana,	Mucilaginous Elm,
Ulmus rubra,	Red Elm,
Ulmus aquatica,	Swamp Elm,
Ulmus alata,	Large-leaved Elm.

The soil and climate of Louisiana, though very fertile and congenial to the plants naturally adapted to the country, do not admit of that variety and excellence of grain, fruits, and culinary vegetables, that is found in the northern states.

Rice is one of the staple commodities of the country. This article is cultivated in abundance on the low lands near the Missisippi, and smaller streams. The land below New-Orleans is particularly adapted to it, and it is there almost exclusively substituted in the place of flour. Many families taste no other food throughout the year than rice. Certainly, if the eating of this grain could have any effect in producing blindness, as has been alleged, it could not fail to manifest its pernicious influence among those persons who are habitually accustomed to its use: and yet the daily and habitual consumption of this article is here found to be perfectly innocent. Rice has an advantage over maize and the other articles of agricul-

ture, since it can be raised in situations too wet and marshy for the cultivation of those substances. Ten or fifteen barrels of rice may be considered as an ordinary crop for an acre of ground. The common price of a barrel of rice in Louisiana, may be estimated at six dollars.

From the Balize to the English Town, 15 miles below New-Orleans, the country is unfit for the habitation of any human being, and adapted for the residence only of alligators, snakes, frogs, and other reptiles and amphibious animals, who claim possession by the right of nature; yet, even in this last place of creation, do we here and there see the habitation of man, amidst the society of these abominable objects. We here behold a few poor, wan, and copper-coloured creatures, who exist by the cultivation of rice, and by raising a few hogs and a little poultry, scattered along this marshy coast, in detached situations of three, four, or more miles asunder, according as they may find a spot of sufficient firmness to support a habitation. Wherever they fix their abode, it is necessary to prevent the inundation, by leveeing the banks of the river, which obliges the water to run off by the collateral passages.

Maize (Indian-Corn) is not raised to any considerable amount in Louisiana; the farmers, finding it more to their interest to receive their supplies of this article from the states of Ohio, Kentucky, and Tennessee, turn their attention to the cultivation of the more profitable commodities, sugar-cane, rice, cotton, indigo, and tobacco: the two latter articles, however, at present, receive but little attention. Besides, the heat of the climate renders maize less productive in Louisiana than in the northern states. In this country, the range that seems to be best adapted to maize, is included between the 35° and 40° of N. lat.

Nor is the climate of Louisiana well adapted to the raising of wheat; its cultivation has been accordingly neglected. The same observation may be made with regard to rye, barley, oats, &c.

The Irish potatoe, in this state, seems to be out of its congenial soil and climate; and generally degenerates in size and taste from the potatoe of the northern states. They might probably be raised of a good quality in the northern parts of the state, where the soil is more sandy, dry, and elevated.

Land of this description lies north of 31° N. lat. and is designated by the growth of oak and hickory timber. The inhabitants depend, for the supply of potatoes, upon Kentucky and Tennessee, whence large quantities of this and other vegetables are brought down by water, during the fall and winter seasons. The climate of this state is well adapted to the growth of the sweet potatoe, (Convolvulus Batatas of Muhlen.) which is here raised in great plenty; though they are not so dry and well flavoured as in the Carolinas.

Culinary vegetables, in general, are inferior in Louisiana to those of the northern states. The carrot and the egg plant are of a good quality; but beets, parsnips, turnips, &c. soon degenerate. The heat of summer scorches and dries up the melons and cucumbers, which wither and die towards the end of June.

Some fine apples are produced in the upper part of this state; but the tree soon sickens, withers, and decays out of its congenial climate, under a scorching sun.

Several kinds of figs have been introduced, and flourish in this state; of these the large purple fig is the most excellent. North of 30° N. lat. it is unable to resist the frost, by which, even south of that parallel, it is sometimes destroyed. The yellow fig, from the south of France, is more hardy, and is the kind most generally cultivated on the Missisippi. This tree flourishes generally throughout the state of Louisiana, as it does also in the Missisippi Territory, wherever the whites, by their enterprise and industry, have made their establishments, and improved the face of the country. This tree lives as far north as the limits of the state extend; and, excepting the peach, is that which is most generally cultivated in our southern climate.

Peaches are found in the northern and western parts of the state, though not in any considerable quantity or perfection, being injured by the heavy rains which fall during the summer season, as likewise by the heat of the climate. The peach is much esteemed by the Indians; and there is scarcely a hut or wigwam in their country where this tree is not to be found. The traveller, in passing through the nations of the Cherokee, Chickesaw, Chactaw, and other tribes of Indians, frequently

finds the Amygdalus Persica encircling and shading the rude habitation of the American savage. When travelling through the wilderness, inhabited by those Indians, in the heat of summer, I have often been gratified and refreshed with this delicious fruit. As yet, peaches are scarce in Louisiana, and very few are brought to New-Orleans.

Below the 30° N. lat. the sweet orange is produced in abundance. The sour orange is found as far north as 33°. The pomegranate also flourishes in the southern part of Louisiana. If this description of tropical fruit-trees, instead of being brought from the West-Indies, had been transplanted from Spain and Italy, the climate of which more nearly resembles that of Louisiana, the change would have been considerably less, and they would thereby have accommodated themselves with greater facility to their new situation, and been better able to resist the cold of winter.

These fruits are of vast importance in the economy of health; there can be no doubt that they are materially connected with the welfare of the inhabitants. They are the antidotes which Nature, in her providential beneficence, has designed and provided as remedies against the diseases of the climate where they abound; illustrating the truth of the circumstance, that *ubi morbus, ibi remedium*, wherever disease prevails, there also exists the remedy.

The cherry, the currant, and the gooseberry, bear fruit with difficulty and in small quantity; and in a short time languish, and die.

Plumbs grow in considerable quantity and variety in different parts of the state, and are brought to the market of New-Orleans.

Grapes of different kinds, as the Vitis laciniosa, (Parsley-leaved Water Grape;) Vitis raparia, (River Grape;) Vitis verrucosa, (Muscadine;) are also common: of these, the latter is the most plentiful. The Cranberry is found upon the banks of the Mermentau. Tree Whortleberries, (Vaccinium arboreum) abound chiefly upon the dry upland, west of the Delta of the Missisippi; and the Vaccinium stamineum and Resinosum, both east and west of the same river.

Of all the plants of agricultural pursuit, which have receiv-

ed the attention of the inhabitants of Louisiana, none has been found so profitable as the sugar-cane. This plant may be cultivated to advantage as far north as the 30° 30′ N. lat. or from about the parallel of Baton Rouge to Fort Plaquemine, 30 miles from the mouth of the Missisippi; which extent, upon a moderate calculation, we may venture to say, contains 7,000,000 acres. Admitting that an eleventh part of this may be cultivated, there remains 636,000 arable acres; of which, allowing half for the cultivation and use of other necessary articles, there is left a residue of 318,000 for the sugar-cane. It is generally considered that an acre of ground will afford 1000 pounds of sugar; but, lest this calculation should exceed the actual quantity, we may make an allowance of 200 pounds, leaving a neat amount of 800 pounds per acre; this multiplied by the number of acres, gives an aggregate of 254,400,000 pounds, which, at eight cents a pound, would yield an annual revenue of 20,352,000 dollars to the state of Louisiana. This calculation is probably considerably short of the amount to which this branch of agricultural emolument will arrive at some future day; since, from the accounts of some respectable planters, it appears that the cane can be advantageously cultivated, even as far north as the Red River, which enters the Missisippi at 31° N. lat. It may also be reasonably presumed, that the increasing warmth of the climate, and the naturalization of the sugar-cane to the American soil and temperature, will considerably increase the saccharine quality of the plant.

Next to the sugar-cane, the cultivation of cotton is the most profitable article of agricultural pursuit; but upon this I shall not enlarge my observations.

A considerable part of the state of Louisiana is of secondary formation, produced by the abrasion and subsequent deposition of alluvial matter, and thus gradually encroaching upon the Gulf of Mexico. Trees are annually torn from their foundation by the undermining current of the river, and, floating down the stream, lodge at the mouth of the Missisippi, upon the bars, and in the shallow water. These bars are formed by the opposing currents of the river and the gulf. The Missisippi carries down the extraneous substances that

it has received in its passage, which, upon arriving at the mouth of the river, meet with an obstruction from the opposition of the tide; the latter, on the other hand, washes the sand and mud from the bottom of the gulf, and meeting with the river, occasions a degree of stagnation in the opposing columns, which permits the alluvial matters to subside. These bars and shallows gradually encroach upon the waters of the gulf, in consequence of the current of the river being stronger than that of the sea. The trees, logs, and bushes, brought down by the Missisippi, are constantly accumulating at its mouth; and at length, by the deposition of leaves, mud, &c. the interstices become filled up; and thus a new portion of land is formed, producing, in its turn, a fresh crop of herbage, shrubs, and trees. That such is the fact, no person will have a moment's hesitation to admit, who has ever visited the mouth of the Missisippi. He has there seen a long raft of mouldering trunks of trees, in different states of decay, adhering to the soft mud in the shallow water, and extending from the land a considerable distance into the gulf; and has thus observed the manner in which this physical change is gradually effected.

It is probable that all the land in the state of Louisiana, south of 31° N. lat. has been formed in this way. In fact, the whole of this state appears to be of modern formation. No rocks, or stones, or mineral substances, are found in the hills between the Ouachitta and the Missisippi. These hills present a regular stratified arrangement of alternate depositions of sand, argillaceous, and calcareous earth; intermixed with which are found shells and other exuviæ of marine animals.* Similar marine substances are also found in the banks of Red River and other places.

The immense shell-banks that are seen at the mouth of the Sabine, and also upon the islands lying between the Mobile and the Missisippi, some of them 50 feet in height, above the reach of the highest tides, and affording support to trees

* North-west of the Missisippi, about the northern confines of Louisiana near the waters of the Derbane and Ouachitta, masses of loose sand-stone, lying parallel to the horizon, are found in some of the hills.

of considerable size upon their summits, evidently show that the waters of the gulf have receded considerably from their original boundaries.

It has been supposed that the Missisippi, as well as the other rivers of Louisiana, ran upon the apex of a ridge. This opinion is certainly erroneous. In no place within the alluvial tract are the banks of the river elevated more than six or eight feet above the general level of the swamp in its vicinity; a circumstance of no moment, when we consider that the river extends to the depth of more than a hundred feet below the surface of the swamp itself. Nor is this elevation of the banks above the general level of the country peculiar to the Missisippi; all the bayous and rivers of Louisiana exhibit the same appearance, in a greater or less degree, proportionate to the size of the streams; and is, in all, to be ascribed to the same causes. This circumstance is to be accounted for in the following manner. It is well known, that when the Missisippi is at its height in the spring, it undermines and sweeps away a number of trees which stand upon its banks; these float along with the current, till driven to the shore, and carried by the inundation upon the river's bank; here, from the shallowness of the water, they become entangled among the standing trees and bushes, and remain permanently fixed; bushes, sticks, leaves, and earth are mixed and deposited among them; and an imbankment of considerable height is thus, in time, effected. From what I have seen, I am satisfied that this is the manner in which this circumstance is to be explained. Below Fort Plaquemine the banks of the river are covered with the trunks of trees, some of them six or eight feet in diameter, for a considerable distance beyond the margin of the river. These are so closely compacted, that a person may walk for miles upon them, in the direction of the river, without touching the earth. By this natural process, at some future time, the banks of the Missisippi, from Plaquemine to the Balize, which are now nothing but a morass, will become as elevated and dry as they are at and above New-Orleans: when, also, an encroachment of equal extent will be made upon the Gulf of Mexico. There is another circumstance which may contribute, in some degree, to this effect; which is, the deposition of earth, that must

necessarily take place upon the water's losing the velocity of its motion immediately on leaving the channel of the river: for it is well known that the quantity of matter which a fluid is capable of holding suspended is increased in proportion to its agitation; whence it follows, that the heavier and earthy matters, which were with difficulty held suspended, will be first deposited in the vicinity of the river, whilst the lighter comminuted vegetable substances will be carried to a greater distance.

In this way, we may reasonably suppose that the whole of the flat and low country of Louisiana has been gradually formed. A considerable portion, even of the most northern parts of this state, is also of alluvial formation. The alluvial banks of the Red River, swelled in its passage by numerous streams, commence about the 33° of N. lat.; and we have already remarked, that, from the Grand Chain of Rocks, 75 miles above the mouth of the Ohio, the Missisippi annually overflows its banks. This inundation becomes more considerable and extensive as we advance towards the mouth of the river.

It is a circumstance worthy of observation, that the Missisippi, from the mouth of the Ohio to Baton Rouge, runs close along the edge of the eastern bluffs, which, in many places, are broken, and are continually falling in fragments into the river; while, on the other hand, in no place throughout this distance, does it come in contact with the bluffs which range along its western bank. Hence it appears that the bed of the Missisippi is slowly progressing towards the east. This circumstance is, no doubt, owing to the quantity of alluvial matter, mud, and sand, that is brought down by the larger rivers, (all of which enter the Missisippi from the west,) and is deposited upon the same side; thereby gradually filling up and diminishing the western portion of the channel of the Missisippi, and increasing upon the same side the extent of the valley through which the river runs.

The Red River and the Missisippi are skirted with an immense number of ponds and lakes in their vicinity, with which they hold communication by small channels and bayous, through which the water rushes upon the rise of the river.

These lakes serve as temporary reservoirs for the superfluous water, which would otherwise occasion a more extensive inundation of the country, and be productive of much injury and inconvenience to the farmer.

The water, in the greater number of these lakes, more especially in those bordering on Red River, is subject to an alternate flux and reflux of its current, occasioned by the rising and falling of the river. In the winter and spring, when the Red River is high, the water runs with considerable force into these lakes, which thereby become replenished, and so continue until the river begins to fall, when the current runs in an opposite direction. In this way, towards the close of the summer, the water in those lakes becomes exhausted and dried up, and their beds are converted into meadows, clothed with verdant and luxuriant herbage. The channel, running through the middle, however, always contains a quantity of water. On one side of most of those lakes, is a range of pine woods, the soil of which gives origin to salubrious and limpid streams, to the convenience and comfort of the inhabitants, who would otherwise be obliged to drink the impure water of Red River.

In the spring of the year, all the swamps in the vicinity of the Missisippi are inundated and filled with water; and the country, in many places, exhibits the appearance of a vast lake. During the summer season, as the river falls, these swamps are gradually exsiccated, so that in autumn they become nearly dry.

Every where, upon the sea-coast, and near the margins of rivers, throughout the state of Louisiana, the attention of the observer is lost and bewildered in the intricate mazes of natural canals, and communicating streams and lakes, that chequer the face of the country. Bayous and rivers inosculating with each other, wind in serpentine meanderings through the alluvial plains. This appearance is more remarkable near the coast of the Gulf of Mexico, where bayous, lakes, woods, and morasses diversify the confused scenery of nature.

We have already noticed the appearance of the country west of the Missisippi, where river is united to river by communicating lakes and bayous; and where soil, the most fertile,

imparts its prolific quality to the support of deep and luxuriant forests of maple, elm, willow, cotton-wood, &c. We have also noticed the different prairies that range between the rivers and the irregular and broken hills which begin to appear in the northern parts of the state; and that, excepting these, the whole country is a flat, alluvial, and marshy soil, formed by the annual overflowing of the rivers, which spread and deposit the ruins of the upper country upon the surface of the inundated earth.

Lakes are more numerous along the course of Red River than on the Missisippi; but the land in the former situation is not so low, and on this account they dry up during the summer season.

The Missisippi begins to rise in January, and continues to rise irregularly till the month of June, when it attains its height. Its fall is then very rapid; not unfrequently passing from its highest to its lowest state in fifteen or twenty days, or even less.

To prevent the inundation of the country, artificial barriers of earth, called *levees*, are raised upon the banks of the river; so that when the Missisippi is at its height, confined between the levees of the opposite sides, it is in many places eight or ten feet above the surface of the adjacent country. The river, thus restrained, sometimes bursts its artificial barrier, and breaks forth through the opening with uncontrollable violence, deluging and destroying the crops of several plantations. During the great freshets of 1811, 1813, and of the present year (1816), great injury was committed by the water bursting this artificial imbankment. This accident is liable to happen from two causes: viz. from a weakness and defect in the levee itself, or from the falling of the bank. Several acres of land are sometimes undermined by the silent gliding of the water; the first intimation of which is the sudden breaking and falling of the incumbent earth into the watery abyss, sometimes carrying along with it the houses and inhabitants of the place. Frequently the falling in of the bank is announced, and for some time preceded by a deep fissure or crack in the earth at the intended place of separation, giving the proprietor an opportunity to secure himself against the accident,

by surrounding the suspected portion with another levee upon the land side, and connecting it with the old one above and below the seat of danger. Notwithstanding this precaution, unforeseen accidents frequently occur, to the great injury of the farmer. It is probable, that if, instead of these levees, the natural canals or bayous were cleared of their obstructions at proper places, and new canals opened in situations where least injury would be done by the redundancy of the water thus carried off, the danger of inundation would be more effectually guarded against. It is, however, a matter of uncertainty, whether the rapidity of the stream would have force enough to keep these channels in a sufficient degree free from obstruction; and whether the trouble of clearing them would not be attended with more labour than the keeping of the levees in repair. One thing is certain, that in such a loose muddy soil, the levees can never afford perfect security. Besides, these artificial imbankments are productive of another physical evil, which is, that they prevent the surface of the country from becoming any higher by the deposition of fresh matter from the overflowing of the rivers' banks, and the consequent accretion of new soil. These are evils, however, to which man, in the gratification of his avarice or wants, must be content to submit.

From Natches to Baton Rouge the country exhibits the appearance of a finely cultivated garden, blooming with a luxuriant growth of cotton, and embellished with numerous well built edifices; whilst groves of orange-trees, clothed in perpetual green, adorn and beautify the landscape. There the pride of the forest, the magnificent magnolia, in aspiring grandeur, rears its majestic head, and by its stateliness and beauty claims the admiration of the passing traveller: its large and polished leaves exhibit a perpetual and unfading verdure; and its extensive, beautiful, and odoriferous blossoms perfume the air with their aromatic fragrance.

Perfect happiness and enjoyment are not the growth of a terrestrial soil: gratification and pleasure are alloyed with care and trouble; and such is the hard condition of human existence, that man is obliged to taste the mingled cup of sweet and bitter. These are moral reflections, as old as the

days of Homer, and faithful as the Oracles of Truth. Their application is easy on the present occasion. With all the advantages of wealth, which Louisiana affords to the inhabitants, it is unquestionably the most unhealthy portion of the United States. A vast alluvion of vegetable mould, and the decaying remains of animals, and of countless myriads of animalculæ, afford a fruitful hot-bed of corruption, quickened by the operation of a powerful sun, and teeming with the generation of sickness and of death.

Previous to the rise of the river, the surface of the earth is hard and dry; but as the river augments, the water rushes through the various bayous or natural channels, and finds admittance to the low grounds beyond the banks, rendering them very moist and wet.

Heat and moisture, by mutual co-operation, cause sickness to prevail with the greatest mortality in the months of June and July. Local circumstances, however, may prevent and vary this effect, as at New-Orleans, where sickness is most prevalent in August. This is owing to the number of ponds lying in the rear and vicinity of the city, which being filled with water throughout the early part of the season, thereby prevent decomposition from taking place in the morass beneath, till the exsiccation of the water is in a great degree effected by the falling of the river and the continuance of heat. From the same local circumstances, it happens, that a rainy season renders the city of New-Orleans healthy, by keeping the ponds filled with water, while it has a contrary effect upon the country generally; so that New-Orleans is healthier than the coast either above or below. In illustration of this circumstance, the classic reader will recal to his recollection the instance related in the history of Empedocles, the Sicilian philosopher and poet, who put an end to pestilential diseases among the Salacentii, by turning two streams of good water into the morass from which they originated.

The wind which generally prevails in Louisiana is from the south. With a few degrees variation, east and west, the current of air proceeds from that quarter for the space of more than six months in the year. These winds are always warmer than those from any other point of the compass, on account

of the atmosphere having been heated in the tropical regions. A south wind, concurring with humidity, is particularly uncomfortable and oppressive. The body is heated, relaxed, and enervated; sweat exudes from every pore; and the air being already saturated with moisture, is unable to receive and take away the perspiration that bedews the surface of the body.

The northern and more elevated parts of the state are less humid and subject to rain than the more sunken, alluvial, and swampy region of the southern portion.

In the month of February the returning spring announces its appearance by the soft fanning of the southern wind. A mild serenity of weather expands and reanimates the dormant germ of vegetation, whose green mantle, at this time, begins to clothe and beautify the face of nature. The month of February, in Louisiana, nearly corresponds, in its effects upon vegetation, to the month of April with us. The farmer and the gardener then return to the culture of the earth, and plant their seeds for the ensuing harvest. The south wind continues to prevail in the month of March, sometimes alternating with sharp blasts from the north and north-west. The wind from the south is frequently accompanied with copious showers. An increase of southwardly winds, accompanied with a greater degree of heat, ushers in the month of April. The nights still continue cool, and in the northern parts of the state, the crops of cotton, in this month, have been sometimes injured by the frost. The growth of the vegetable world, aided by the occasional refreshment of gentle showers, proceeds with rapid strides. A mild temperature of air and serenity of weather afford enjoyment to man; while, at the same time, he beholds with a degree of complacency bordering on delight, the rich, verdant, and flowery prospect which every where adorns the face of creation. The nights, as yet, are comfortably cool. During the month of May the winds shift more to the east and west; the heat increases, and becomes uncomfortable; vegetation proceeds rapidly towards maturity, and culinary vegetables are now in the height of their perfection. In June, the temperature of the weather is hotter and more oppressive. Showers are less frequent, and vegetation often languishes and withers for want of rain. The soil being light and spongy, retains the

water but a short time; and the surface of the earth becomes exsiccated into a hard dry crust. The month of July is sultry and oppressive. The wind from the south and south-east brings frequent showers of rain; which descends in inundating torrents, preceded and accompanied with loud peals of thunder and vivid flashes of lightning. The heat continues to prevail, with little variation, throughout the months of July, August, and September. It is at this season that the powerful sun shines forth with sickening beams upon the hot-bed of mouldering creation, and excites into activity the miasmatic agents of disease and death.

During the hot months of summer the thermometer ranges from 80 to 87°, and not unfrequently rises to 90°, or even higher. Man languishes under the oppressive heat; and through the day his clothes are constantly wet with sweat exuding from every pore of the body. Though the heat of the day is oppressive, the nights are cool and refreshing. This is owing to the humidity of the atmosphere, occasioned by the quantity of aqueous vapour exhaled, during the day, by the burning sun, from the humid earth. As soon as the bright luminary has sunk beneath the western horizon, the dew falls in copious quantity, and by its density abstracts the heat, and affords a comfortable coolness to the body. At the same time, the vapours are collected over the Missisippi and other streams, in the form of a thick fog, of such a degree of density, as to render objects invisible at the distance of 30 yards. They commonly rise only to the height of 30 or 40 feet. These *low hung vapours, motionless and still*, remain during the night undisturbed by a breath of wind; and in the morning, as soon as the sun begins to exert his influence, and calls forth the breeze, they may be seen rising by degrees above the surface of the water, suspended between the earth and sky, till, at length, dispersed and scattered by the god of day, they vanish in thin air.

The winter is cool, with frequent, strong, and chilling winds from the north and north-west. The thermometer, during this season, fluctuates between 45 and 56°. Rain is frequent, rendering the country wet and miry. Frost is very seldom observed as low as New-Orleans, and snow never; though the latter is sometimes seen in the northern parts of the state, and frost

often; where the crops are sometimes injured by it, even in the month of April. At and below New-Orleans, the cold is never sufficient to stop the growth of lettuce and radishes, which are always best in the winter season. Cabbages, as if by instinctive consciousness that the cold of winter is not sufficient to injure their expanded leaves, after the first year cease to head.

One of the greatest torments that was ever sent to afflict man for his iniquities in this world, is the musquetoe. This tribe of tormentors begin to swarm with the returning heat of the season in April, and continue their annoyance till they are stiffened and benumbed by the cold of November. As soon as the evening shades begin to prevail, the air is thickened with swarming myriads of these venomous insects, that arise in clouds, from the meadows and marshes, like volumes of dust in the deserts of Arabia. Their murmuring tinkling singing is so strongly associated in the mind with the disagreeable sensation of their bite, that their noise is rendered far more unpleasant than the most discordant music, the pealing thunder, or the rattling storm. Without the protection of screening curtains to defend him from the unremitting intrusion of these active and vigilant attendants upon man's sleeping moments, as well might he endeavour to seek repose upon a bed of thorns. Blood is their cry; nothing but blood will quench their thirst and satisfy their sanguinary appetites. Compared with them, the musquetoes of the northern states are mere gnats. Furnished with a bill like iron, they perforate the toughest hide, and drink the crimson stream of man and beast.

It is well known that musquetoes and other noxious insects are most numerous in wet and marshy places, where ponds, lakes, and morasses diversify the face of the country; and where morbific miasmata are exhaled in greatest quantity, and contaminate the atmosphere. It may therefore be considered as an indication of nature, that wherever those insects are very numerous, there also unwholesome exhalations prevail, inimical and dangerous to health, and destructive to human existence.

The chigoe is another troublesome insect in Louisiana, as well as in the other southern states, but far less common than the musquetoe. It is a sort of small flea, but little larger than

a cheese-mite, bred in the dust and in the chimney-corners. Without being perceived, these insects insinuate themselves under the skin of the feet and about the toe-nails: where a little bag, about the size of a small pea, is formed around them before they are discovered. This bag forms the nidus of the parent chigoe; that appears through the skin of a bluish colour, and is surrounded with an innumerable multitude of young animalcules contained in the capsule. From being suffered to remain, these chigoes multiply by generation in the skin and under the nails, and the young broods, dispersing, extend their habitations in every direction. These animals are particularly troublesome to the bare-footed negroes. In removing them, care should be taken not to break the bag in which they are contained; the hole may then be filled with tobacco-ashes.

The stingray is also worthy of notice, on account of the wounds which the men sometimes receive from its poisonous tail, by accidentally treading on this fish, which lies in shallow water, along the shore of the Gulf of Mexico. To obviate any dangerous consequence, the puncture should be dilated with a knife and touched with lunar caustic.

The centipede, mokason, rattlesnake, &c. also deserve to be noticed among the noxious animals and reptiles of Louisiana; but my limits do not permit me to enlarge upon the subject.

With respect to animals used as food, it may be observed, that, in general, the flavour of their meat is less pleasant to the taste than that of the northern states. We may make an exception of their mutton, which is by far the best meat the market of New Orleans affords, and appears superior to that of the north: but whether this superiority is real or only comparative, as being so much more excellent than the beef, I am unable to determine. The impure water of the Missisippi affords but a small variety of fish; scarcely any are caught but the cat-fish, which is very large—sometimes weighing 60 or 80 pounds. This fish, though eatable, is by no means delicious.

Some Observations on a Species of Pulmonary Consumption, very frequent in Great Britain. By Alexander P. Wilson Philip, M.D. F.R.S. Ed. of Worcester.

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To many physicians there will probably be nothing new in the following observations; but this remark I believe will not apply to the greater number of medical men, because it is very common for the different species of pulmonary consumption to be regarded as the same disease, and treated in the same way; nor is it probable that the species which I am about to consider will be generally distinguished till some separate treatise, which as far as I know has not yet appeared, calls the attention of the public to it; yet it will be evident, I think, from the following observations, that its nature is very different from that of other species of the disease; and that while, under the common treatment, it is nearly as fatal as these species, under that which is suited to it, its progress may generally in the earlier, and sometimes even in the more advanced stages, be arrested.

I shall, in the first place, point out the symptoms by which this species of pulmonary consumption is distinguished; then make some observations on its causes, and point out the analogy, which exists between it and many diseases apparently altogether of a different nature; and in the last place, I shall detail the plan of treatment, which I have found most successful in it.

Of the Symptoms.

I had occasion, twelve years ago, to mention this species of consumption and the plan of treatment adapted to it, in the second edition of my treatise on Febrile Diseases. Since that time it has particularly attracted my attention. It cannot therefore, I think, fail to be of some use to those whose attention has also been directed to it, to see the observations I have been led to make in so many years' pretty extensive experience of it; for there are few diseases so frequent in the

part of England in which I reside, and indeed I believe, in most parts of Great Britain. To those whose attention has not yet been particularly directed to it, any observations on the subject must be useful.

It is not my intention to give a detailed account of the symptoms of this species of phthisis. I shall only mention the symptoms and modifications of symptoms by which it is distinguished. Contrary to what is usual in other species of the disease, the spirits from the beginning are generally more or less depressed, and the countenance is more sallow than usual. The cough at first is generally dry, or the patient brings up a little mucus after a severe, and often long continued fit of coughing, which seems to be rather the effect of the irritation of coughing than any thing which had previously existed in the lungs; for the cough in this species of consumption, particularly in its early stages, frequently comes in violent fits, in the intervals of which the patient is often but little troubled with it. These fits are particularly apt to occur after he has eaten, especially if he has eaten a great deal, or any thing by which the digestion is disturbed, and on lying down. In many instances they are most apt to come on when he lies on the left side, sometimes when he lies on the right. I think in almost all cases, they are least apt to occur in the recumbent position, when the patient lies on the back with the shoulders a little raised; and it often happens in the more advanced stages, long before the strength is much exhausted, that this is the only position in which he can lie without inconvenience. As in all other forms of phthisis, so in this it is common for the cough to be troublesome for some time after awaking in the morning.

As the disease proceeds, the cough becomes more frequent, returns less decidedly by fits, and is attended with a more copious expectoration. In all these respects there is of course considerable variety in different cases, but in almost all the general character here pointed out may be observed. The matter expectorated is at first limpid and glairy; by degrees we see intermixed with it small portions of an opake pus-like substance, the proportion of which in the progress of the disease increases; and in some cases the quantity expectorated is

astonishing, often much greater in proportion to the severity of the other symptoms, than in other species of phthisis. I have often seen half a pint or more of pus-like matter mixed with tough phlegm expectorated daily, when the other symptoms were comparatively mild. In other species of phthisis, very copious and long continued expectoration of pus-like matter is less common. In them such copious expectoration generally arises from the bursting of a vomica. The matter it contained, if not sufficient to occasion suffocation, being brought up, the quantity expectorated is again reduced till another vomica bursts.

Bloody expectoration is by no means uncommon in this species of phthisis. Blood often appears early in the disease mixed with the colourless phlegm. After the pus-like expectoration commences, if blood has not previously appeared, it is much less apt to appear than in other forms of the disease. If it even appear in small quantity after this stage commences, the case generally proves fatal. While the blood is mixed only with a transparent fluid, there may be good hopes of recovery, certainly better than under the same circumstances in any other species of phthisis. A similar observation applies to the pus-like expectoration. If there be no admixture of blood, there may be good hopes of recovery, if the disease has not lasted long; and certainly much better than under the same circumstances in other species of it, though expectorated matter is less apt than in these to assume a sanious appearance; but when this occurs, it seems to indicate nearly as much danger as in them. If this happen under the proper treatment, there is no hope. Nearly the same may be said of every admixture of pus-like matter and blood occurring under these circumstances.

I here wave all discussion respecting the means of distintinguishing pus and mucus. In my treatise on febrile diseases, I have considered the question at length. It is necessary in practice to have means of judging independent of nice experiments. Whether the matter I call pus-like, be pus or not, is not here the question; it is that to which the observations, which I am about to lay before the reader, apply. The only criteria, which I have found necessary in practice, are its pus-

like appearance, and its sinking when so agitated in water as to separate it from the tough mucus, with which it is mixed. I am inclined to think that this substance is almost always real pus. But if we know what states of disease are connected with what appearances in the expectorated matter, it is of comparatively little consequence whether what we see be pus or not.

The breathing in the earlier stages of this species of phthisis, is sometimes more oppressed by the recumbent posture, than in other forms of the disease; and is more frequently attended with a sense of tightness across the pit of the stomach. The same observations which apply to the cough in the recumbent position, and after eating, apply to the dyspnœa; but it often happens in the early stages, that there is little or no dyspnœa; and there is very rarely, except in the advanced stages, that marked dyspnœa on exercise, which so frequently attends even the commencement of other forms of the disease.

There is often little or no pain. In many cases the patient is subject to a dull pain in the pit of the stomach, or pretty low down in the left side of the chest; more rarely, the pain is in the same part in the right side. There is hardly ever a fixed pain high in the chest, although in some cases there is an uneasy sensation and a sense of oppression under the sternum. The patient sometimes complains of darting pains in various parts of the chest, and frequently in more distant parts, particularly in the limbs, back and shoulders; and is often subject to headach.

The hectic fever in the earlier stages is hardly ever so completely formed as in other species of phthisis, and sometimes there is a copious purulent expectoration with but slight fever, and that not at all assuming the form of hectic, the skin remaining dry in the morning, and there being little or no evening exacerbation; a state of the symptoms hardly ever observed in other forms of the disease.

The emaciation is seldom so rapid as in other species of phthisis, but seems to keep pace with the state of the fever.

Such is the manner in which the symptoms common to all forms of phthisis are modified in this species of it, but a diagnosis resting merely on the modification of symptoms must always be fallacious; it is therefore fortunate, that in the

present instance, there is superadded to the usual symptoms of phthisis, others peculiar to this species, by which, with very little attention, it may always be distinguished; symptoms indicating a deranged state of the digestive organs. The patient is often distressed with flatulence and irregular bowels, the tongue is furred, the appetite for the most part, contrary to what is usual in other forms of the disease, much impaired, the fæces seldom well coloured, and the epigastric region more or less full and tender on pressure. These symptoms vary much at different times, but the patient is hardly ever free from them. The connection between them and the pulmonary symptoms is rendered evident by the latter increasing with the former; so that when the epigastric region is very full and tender, the cough and dyspnœa are more troublesome; and on the fulness and the tenderness subsiding, the pulmonary symptoms abate. Even the rising of wind from the stomach often, for the time, removes the tendency to cough.

The foregoing are the symptoms of the more early stages of that species of phthisis which I am endeavouring to distinguish, because I have found it requires a very different plan of treatment from other forms of this disease. In its advanced stages, it approaches more and more to these forms. All the symptoms, which more particularly indicate a tubercular state of the lungs, show themselves; the cough is more constant, and partakes more of the hacking kind; the breathing is more affected by exercise, the hectic is more completely formed, the fulness and tendency of the epigastric region are often lessened, and sometimes wholly disappear; which, if the pulmonary symptoms continue unabated, always, I believe, affords a fatal prognosis. The patient at length sinks with precisely the same symptoms as in other species of phthisis. In addition to these, particularly if the affection of the digestive organs has been neglected, some of the more prominent consequences of this affection sometimes show themselves, particularly dropsy of the belly, which I never knew to supervene in other cases of phthisis.

Of the Causes.

The species of phthisis which I am considering arises from all the causes of this disease, with the exception of those whose

operation is confined to the lungs themselves, the inhaling of dust, other diseases of the lungs, the bones pressing unequally on them, &c. yet its causes are not less numerous than those of other forms of phthisis. To compensate for the want of those causes immediately affecting the lungs, we have a numerous set of causes affecting the digestive organs. Drunkards, at that time of life which disposes to phthisis, frequently fall a sacrifice to this form of the disease; and those who have been long subject to severe attacks of dyspepsia, and what are called bilious complaints, are liable to it. In short, we perceive equally in its causes, as in its symptoms, its connection with the state of the digestive organs, from which it may be justly termed dyspeptic phthisis. It particularly deserves attention, that, in many families, this form of the disease alone appears. When this is the case, its fatal effects may generally, I believe, be prevented by carefully avoiding the causes which tend to debilitate the digestive organs, and watching the first approach of the disease.

Of the Appearances on Dissection.

The appearances of the lungs are generally much the same as in other cases of phthisis; but we almost always find at the same time, either a diseased state of the liver, or traces of disease having existed in it. In cases where the disease of the liver has been severe, and the patient has died as much of this disease, as of that of the lungs, I have repeatedly found those parts of the lungs in the neighbourhood of the liver, alone affected, the left side appearing sound or nearly so. In general, however, the affection of the liver seems to have little immediate share in the cause of death, and the patient lives, as in other cases of phthisis, till almost the whole lungs are rendered incapable of their function. Here, as in many other cases, we often have occasion to remark to what extent change of structure even in the vital organs may go without destroying life, when the change is very slowly effected; a circumstance which, perhaps more than any other, shows the resources in the structure of the body itself, against the effects of disease.

It is not at all uncommon in dyspeptic phthisis to find the spleen as well as the liver diseased. As the cœliac artery dividing into

three branches supplies the liver, stomach and spleen, may we not suppose that the pain so frequently felt in the left side and in the stomach in this form of phthisis, arises from more than the due quantity of blood being thrown into the vessels of these organs in consequence of the obstructed state of the liver? Is it owing to their being supplied by the same artery, that we so frequently find a diseased state of the liver and spleen in the same subject, and that inflammations of these organs so frequently alternate with each other? I have repeatedly seen the inflammation pass from the one organ to the other, and back again to that first affected.

Of the Nature of Dyspeptic Phthisis.

It is impossible to observe even in a cursory manner the symptoms of this disease, without remarking that the state of the lungs is connected with that of the digestive organs. Its causes we have seen afford the same inference, and in those who die of it, I have just had occasion to remark, we very frequently find a diseased state, or proofs of a diseased state having existed in one of the organs of digestion, whose intimate sympathy with the others, numberless observations prove. A question of the first importance in the treatment of this disease here arises. What is the nature of the relation observed between the affection of the lungs and that of the digestive organs in this species of phthisis? is the one a consequence of the other, or are they simultaneous affections arising from a common cause? they are not simultaneous affections, for the one always precedes the other. In by far the majority of cases in which both the lungs and digestive organs are affected, the affection of the digestive organs precedes that of the lungs. In some instances we find the affection of the lungs the primary disease. But in these, the case does not assume the form above described, but that of simple phthisis; and the hepatic affection, which is always the most prominent feature of this derangement in the digestive organs, does not show itself till a late period of the disease, and then little if at all influences the essential symptoms.

We often observe the first of these forms of the disease arise from causes evidently acting on the digestive organs,

and as far as we can perceive in no degree on the lungs, and the last from causes evidently acting on the lungs, and in no degree on the digestive organs.

It seems to be a necessary inference from the preceding facts, that a diseased state of either set of organs may produce that of the other. But the tendency of disease to spread from the digestive organs to the lungs is much greater, than that to spread from the latter to the former. We often see a slight degree of derangement in the digestive organs produce cough and other pulmonary symptoms, and derangement seldom exists in all the digestive organs without producing more or less of these symptoms: whereas it is only after disease has advanced very far in the lungs, that it is apt to spread to the digestive organs, and in the greater number of instances it proves fatal without spreading to them.

When to these circumstances we add, that all the peculiarities of those cases of phthisis, which are from the commencement accompanied with disease of the digestive organs, may be easily explained by the existence of this disease; and that, as I shall presently have occasion to point out more at length, every thing which relieves this disease, at the same time relieves the pulmonary symptoms that attend it, the inference appears to be unavoidable, that in the species of phthisis which is the subject of this paper, the pulmonary disease arises from that of the digestive organs. It is not to be overlooked, however, that it is in those most disposed to pulmonary affection that disease of the digestive organs most frequently produces it. We consequently see this species of phthisis most apt to occur in the same habit which disposes to other forms of that disease. On the other hand, when the digestive organs are naturally weak, or powerful causes of disease in them have existed, particularly the free use of spirituous liquors, we often see it occurring in habits apparently least disposed to pulmonary affection.

It will place in a clearer light what has been said of the nature of the disease before us, to take a cursory view of the sympathy which exists between the state of the digestive organs, and the principal seat of derangement in some other diseases. Let me here refer to a work, which no physician, whatever

may be the extent of his experience and the accuracy of his observation, can peruse without advantage, although the modesty of its author has induced him to address it only to those belonging to his own branch of the profession; I mean the work of Mr. Abernethy, entitled "*Surgical observations on the constitutional origin and treatment of local diseases.*" I believe that experience has led many others to similar views, but no other person has laid them before the public in the way in which Mr. Abernethy has done, and those physicians whose attention has been directed the same way must be happy to see in Mr. Abernethy's work, a confirmation of their own observations; and such a confirmation as they were not likely to receive from the work of a physician. The physician's attention is directed to internal disease; there his inquiries naturally begin. Mr. Abernethy's, for a similar reason, began with external disease, and I believe every physician circumstanced as I was, will feel as I felt on reading his work. I unexpectedly met him on a road where I did not expect to meet a surgeon, but where the assistance of a surgeon was of greater consequence to me than that of any physician could have been. From local, he was unavoidably carrying on his observations to general diseases. The sympathies in question so connect them that it was impossible for him to do otherwise. From general, I was, for the same reason, carrying mine on to local diseases. In the case of dyspeptic phthisis which Mr. Abernethy relates, the reader will find the principle of the treatment which I have employed in phthisis for more than twelve years, as many medical men of this neighbourhood have witnessed; and the following cases which occurred to me before I read his work, or was acquainted with his opinions, and which I shall relate as concisely as I can, will afford a confirmation of these opinions and of the practice founded on them in local diseases. I mention these cases, because like Mr. Abernethy's case of phthisis, they tend to confirm the accuracy both of his observations and mine; for surely no stronger confirmation can be required of any opinion, than two observers wholly unconnected, setting out from the most opposite quarters, and meeting in the same point. My plans of practice are not precisely the same as Mr. Abernethy's, and in particular the mode of giving

mercury in internal disease, which I have found most successful, is different from his, but the general principle is the same.

A gentleman consulted me for severe pains in the legs, for which he had been treated unsuccessfully for two years. There was no reason to suspect syphilitic affection. I found his digestive organs deranged, and the epigastric region tender on pressure. He took a grain of blue pill combined with stomachic and opening medicines three or four times a day, and was cured in a few weeks. A gentleman had sores continually breaking out on various parts of the body which had proved very obstinate, for which he had been advised to go through a regular course of mercury. The digestion was deranged, and the epigastrium tender. I dissuaded him from any thing like a regular course of mercury. He took stomachic and opening medicines, with a grain of calomel every second or third night, and was cured in about a fortnight. A lady after repeated attacks of illness remained very weak; glandular swellings appeared in different parts of the body, and it was feared that a general breaking up of the constitution was about to take place. The appetite failed, the bowels were disordered, and the epigastrium was tender. She took sometimes a grain of blue pill two or three times a day, with stomachic and opening medicines, and at other times either a few grains of blue pill, or one grain of calomel, according to the state of the bowels every second or third night; no application being made to the glandular swellings, but occasionally two or three leeches when they were tender on pressure. In about three months her complaints disappeared under this plan of treatment, nothing but a depression of spirits remaining, which was removed by change of air.

In one respect Mr. Abernethy's mode of giving mercury in the cases above alluded to, and that to which I have been led in internal disease, arising from the sympathy of other parts with the digestive organs, agree. It is from small and undebilitating quantities that good effects are to be expected; in such cases, given otherwise it debilitates the digestive organs, and often thus increases the disease. The chief difference in our modes of giving it is, that he gives large doses at long intervals, I give minute doses at short intervals. This difference

has probably arisen from the nature of the diseases in which we have chiefly practised. Since I became acquainted with Mr. Abernethy's plan, I have tried it in internal disease, but have not found it so successful as that which I have been accustomed to pursue. Of the comparative effects of these plans in local diseases, I have not had sufficient opportunities of judging; and Mr. Abernethy does not mention his having tried the plan which I shall presently have occasion more particularly to lay before the reader.

Mr. Abernethy mentions other internal diseases, particularly those of the head and heart, caused by the deranged state of the digestive organs. I have repeatedly seen his observations on those diseases confirmed, and could relate several cases in which the patient had for years laboured under symptoms of *angina pectoris*, and had been treated for this disease, in which the symptoms yielded in a few weeks to small doses of blue pill combined with stomachic and opening medicines. In such cases we must of course suppose, that no organic disease of the heart had yet supervened. His observations on the brain are well illustrated by two excellent treatises lately published by Dr. Cheyne*, and Dr. Yeates†, on the diseases which has been called hydrocephalus internus. It seems surprising that the immediate connection of this disease with the state of the digestive organs should so long have escaped physicians.

It is not meant that hydrencephalus, as Dr. Smith‡ more correctly terms it, always arises from affections of these organs. In many instances it evidently arises from causes acting on the brain itself; but were I to speak from my own experience, I should say, that in at least five cases out of six it arises from the former cause; and that, in all cases, preserving a proper state of the digestive organs is the best means of prevention; for even where it arises from other causes, their tendency

* A second Essay on Hydrocephalus Acutus or Dropsy in the Brain, by J. Cheyne, M. D. &c. Dublin, 1815.

† A statement of the early symptoms which lead to the disease termed water in the brain, &c. in a letter to Martin Wall, Esq. M. D. &c. by G. D. Yeates, M. D. &c. London, 1815.

‡ A treatise on hydrencephalus or dropsy of the brain, by J. C. Smith, M D. &c. London, 1814.

to produce it will be greater or less according to the state of these organs.

The effects of the sympathy which exists between different parts of the animal body in the production of disease, does not seem to have obtained the attention it deserves. It is well known that nervous affections will, if I may use the expression, mimic the symptoms of almost every disease, but it does not seem to be generally admitted, although I think we have sufficient proof of the fact, that if this mimic disease is kept up for a certain length of time it will be converted into the real disease, let the cause which produced it be what it may. I cannot chuse a more striking instance to illustrate this observation, than one intimately connected with the form of phthisis which we are considering.

In the 43d, 44th, and 45th sections of Morgagni's 21st epistle, the reader will find the pleuritis verminosa treated of at some length. He mentions one case in which all the symptoms of pleurisy were well marked, that terminated favourably by a bloody vomiting which brought up a lumbricus. We might in this instance attribute the relief obtained rather to the loss of blood than the expulsion of the worm; but he refers to a paper of Pedratto on the pleuritis verminosa, where the relief obtained by the expulsion of worms from the stomach and intestines, particularly from the former, is unequivocally proved. It there appears, that all who vomited the worms or passed them by stool recovered, while those who did not, died. All the common means of treatment in pneumonia failed, anthelmintics alone were successful. While the expulsion of worms from the *primæ viæ* immediately removed the disease, it is impossible for us to believe that real inflammation of the lungs had existed; yet in those in whom the disease proved fatal, the same appearances were found in the thoracic viscera, as in those who die of other forms of pneumonia. Thus disordered digestion produces palpitation and syncope, and if these symptoms continue to recur for a great length of time, they end in real disease of the heart. Thus the same cause produces drowsiness and inability, which if long continued, ends in real disease of the brain. They produce cough and dyspnœa, and, if long continued, real disease of the lungs. In all these and many similar

instances, no real disease seems at first to exist in the parts sympathetically affected. We must suppose, however, that some degree of debility or aptitude to disease exists in them, which determines the sympathy to affect them, in preference to other parts, with which the part originally affected equally sympathises; or there may be something in the original affection, which we cannot trace, that determines it to sympathise more with one part than another.

We see the same law obtaining in every instance: when affections of the liver produce pain in the shoulder, there is no disease in this part; the pain is merely sympathetic; we may press and rub the shoulder, the patient feels no more uneasiness from it than he would in the other shoulder; but after the pain has continued for a considerable time, the shoulder itself becomes affected. The patient cannot bear to have it pressed, and sometimes cannot lie upon it. When inflammation spreads from the intercostal muscles to the lungs, it does not traverse the pleura, reaching the lungs by the fold which reflects this membrane over them; it passes at once from the pleura of the ribs to that of the lungs, between which there is no direct communication either of vessels or nerves, for this often happens previous to any adhesion having taken place. Why is inflammation of the bowels as apt to spread to the contiguous bowels, with which they have no immediate connection, as to those parts which are in continuation with the diseased part? why does loss of blood by the application of a few leeches to the skin over an inflamed viscus, often give more relief than the loss of many times as much blood from a distant part? why does the skin over diseased viscera, even when no adhesions have taken place, frequently change its colour, especially as death approaches, as I have often witnessed? why do eruptions of the skin, often very slight, alternate with serious diseases of internal parts? it is needless to multiply such instances; whoever observes with attention the phenomena of disease will find them numberless. They are all referable to one law, by which neighbouring parts always, and distant parts often sympathise, independently of any direct communication either of nerves or vessels.

How we are to account for this sympathy I shall not here

inquire. It teaches us an important lesson in the prevention of disease, that the first beginnings of many sympathetic affections, deemed trivial, should be watched with care. The headach frequently occurring from disordered stomach may at length become a disease of the head itself; and there is no viscus, we have reason to believe, in which disease may not arise in the same way. It teaches us a lesson of equal importance in the treatment of diseases, to make ourselves minutely acquainted with their history, in order to ascertain, if possible, whether sympathy with other parts had contributed to produce disease in the parts now most prominently affected; for if this be the case, and the affection of the former still continue, we shall attempt in vain to restore health by means directed only to the seat of the prominent disease. In this way, we have reason to believe many cases are allowed to prove fatal, for which a remedy may be found if we trace them to their source. The most remarkable instance of this kind which has occurred to me is the dyspeptic phthisis, on the treatment of which I am now to offer the remarks which a long attention to it has suggested.

Of the Treatment of Dyspeptic Phthisis.

In speaking of the treatment of this form of phthisis, I shall follow the same plan which was adopted in speaking of its symptoms, confining myself to those circumstances in which it differs from the other species of phthisis.

As it appears both from the symptoms and causes of dyspeptic phthisis, that the affection of the lungs is influenced by the state of the digestive organs, it is reasonable to suppose that the means which tend to improve their functions will here be a useful auxiliary to those usually employed in phthisis. In the dyspeptic we always perceive sooner or later some fulness and tenderness of the epigastric region. It is after these have supervened that disorder of the digestive organs is apt to affect the lungs; and it is in proportion as we relieve them, that we find the affection of the lungs relieved. This fulness and tenderness which we have found the best diagnostic of dyspeptic phthisis, appears from dissection to arise chiefly from an affection of the liver, and the degree of these symptoms is generally a pretty correct measure of its degree.

This species of phthisis may be divided into three stages, in which the prognosis and mode of treatment are different. In the first, the affection of the lungs is merely sympathetic, so that when the cause which produces it is removed, it ceases of course. This stage is distinguished by the short time which the disease has lasted, by the general mildness of the symptoms*, the fever in particular being very slight, and by there generally being no expectoration but what the cough itself seems to occasion, consisting of a colourless phlegm, and for the most part in small quantity. Sometimes what is expectorated is in masses of a tough glairy appearance, and of a blackish hue as if mixed with a small portion of carbon, which seem to have lain some time in the lungs, the expectoration of which relieves the cough, which in this case is seldom very troublesome. This last appearance of the expectorated matter generally indicates the very mildest form of the disease; it is when there is no expectoration, or when it is thin, scanty and difficult, that the disease is most apt to degenerate into the more alarming forms.

In the second stage of dyspeptic phthisis the continuance of the sympathetic affection has produced actual disease in the lungs. There are two ways in which this disease indicates itself. The most frequent is by some degree of inflammation supervening on the surface of some part of the bronchiæ or air cells, in consequence of which the expectorated matter begins to be mixed with small portions of a pus-like substance, which gradually increases as the inflammation extends, till the quantity we have seen is often astonishingly great. Sir Everard Home, in a treatise on the properties of pus, has shown how readily irritation of secreting surfaces produces it, independently of any breach of substance. Less frequently small vessels now and then give way, which prevents the inflammatory action, so that the expectorated matter presents no degree of the purulent appearance, but is occasionally mixed with blood. The symptoms now assume a more formidable character, the tendency to fever in particular is greater; but it seldom completely puts on the

* I do not here speak of active inflammation of the liver which also produces cough and dyspnœa, and whose phenomena further illustrate the sympathy of which I have had occasion to say so much.

form of hectic. In this stage there is either no breach of substance in the lungs, or the litt e vessels which from time to time give way, soon heal. It seems to be at this period that tubercles generally form. These going on to suppuration and ulceration, or the irritated surface of the bronchiæ and air-cells becoming ulcerated, the last stage commences, in which dyspeptic phthisis is nearly as fatal as any other form of the disease.

This stage is indicated by the aggravation of all the symptoms, particularly by the fever assuming more perfectly the form of hectic, and the expectorated matter occasionally containing both a pus-like matter and blood. It often happens however, especially where there has been no expectoration of blood at an early period, that no blood is ever expectorated. In this last stage the expectorated matter occasionally assumes all the various appearances observed in the last stage of other cases of phthisis.

In the first of the above stages the disease generally yields readily, except the dyspeptic symptoms are peculiarly obstinate, (in which case some degree of them has generally been of long standing, or the patient has suffered from former attacks of the disease), or there is such a tendency to a tubercular state of the lungs, that the hepatic affection which I have had occasion to observe always shows itself before dyspepsia produces phthisis, and this state of the lungs occurs almost at the same time. Such appear to me to be the chief circumstances which sometimes render the disease fatal even when properly treated at this early period; but so generally successful is a proper treatment at this period, that it required many years' observation to convince me that it will not always succeed, and to satisfy my mind respecting the causes of its failure. The last of the causes just mentioned I am convinced is the most frequent of them. It is evident that when the tendency to tubercles of the lungs is so great, the case is pretty much of the same nature with that form of phthisis which originates in the lungs, whose fatal tendency no mode of treatment, however early adopted, will always prevent.

It always adds much to the unfavourable prognosis to find that the patient has scrophulous enlargement of the more external glands, which is often such as cannot be seen, but only felt.

It will be generally admitted, I believe, that external glandular swellings and suppurations often tend to prevent internal disease. We see in the same family, some fall a sacrifice to phthisis, while others, labouring under these swellings, escape it. I have seen a person in the last stage of phthisis saved by the glands of the neck suddenly swelling and suppurating. But that slight enlargement of the external glands which may be rather felt than seen, while it indicates, is not of sufficient importance to obviate the tendency to internal disease.

Provided there is no great tendency to tubercles, and the hepatic affection is not unusually obstinate, the first stage of hepatic phthisis generally yields to the usual means of relieving the cough and tendency to fever, combined with such an attention to diet as prevents the stomach being oppressed, keeping up a freer action of the bowels than is necessary in health, and taking care by occasional doses of blue pill or calomel, according as the bowels are more or less easily acted on, to preserve a sufficiently copious and healthy secretion of bile. I have generally given the mercurial, for the most part one grain of calomel combined with the compound extract of colocynth, every second or third night, desiring the patient not to go out the next day, till it shall have passed off, and if it does not pass off in a couple of hours after rising, to assist it by a moderate dose of Epsom salts. In addition to these means stomachic medicines were generally used, particularly when the appetite was much impaired.

All of this class of medicines which possess any heating quality have appeared objectionable. Even gentian, so useful in the cases mentioned by Mr. Abernethy, seems often to increase the cough and the tenderness of the epigastrium. I have found extract of camomile flowers, combined with small quantities of the powder or oil of carraway among the best stomachics in such cases; and unless the strength be much reduced, Epsom salts have appeared to be the best assistant to the cathartic effects of the mercurial. The latter I have given, not for the purpose of moving the bowels, but improving the state of the bile, and therefore only in very small doses. I have seldom seen much advantage arise from giving more than one

grain of calomel. There is the strongest objection in all diseases tending to phthisis to debilitating doses of any medicine.

The second stage of dyspeptic phthisis requires a plan of treatment essentially different from the foregoing. When the disease has been neglected till this stage commences, which is very frequently the case, or we find, that notwithstanding the employment of the above means, the sputa begin to assume a purulent appearance, or to be mixed with blood, the tenderness of the epigastrium continuing, and an unhealthy secretion of bile constantly recurring, we may be assured that the foregoing means will be ineffectual; and that if time be lost with them till the third stage supervenes, life will be sacrificed.

The following is the plan which, under such circumstances, I have for the last nine or ten years adopted, and the efficacy of which has induced me to offer these observations to the attention of the public. Either laying aside or continuing the occasional grain of calomel as the state of the bowels seems to require, I have given one grain of the blue pill combined with some mild stomachic, two or three times in the course of twenty-four hours, continuing it either till the tenderness of the epigastric region yielded, and a proper secretion of bile was restored, or the gums appeared a little redder and fuller than natural.

As the tenderness of the epigastrium abates, and the fæces assume the natural appearance, in by far the majority of cases the pulmonary symptoms gradually disappear. It has been said by many who have seen my practice, that little is to be expected from such minute doses; but I have found the gradual effect produced by such doses on the whole much more beneficial, than the more sudden effects resulting from larger ones, which often induce a degree of debility that more than compensates for the advantage obtained from them. There are no other circumstances perhaps, under which mercury is given, where it is of so much consequence to support the strength. The evident advantage of this in all cases of phthisis is such, as to have induced some to adopt the tonic plan in defiance of every counterindication; by which I have often, particularly in this species of phthisis, which bears tonics worse than that which originates in the lungs, seen those who, there was reason to believe,

might have recovered, lost; and those whose illness might have been long protracted, suddenly destroyed.

With the foregoing, I have always combined local means for the purpose of relieving the tenderness of the epigastrium. If it be not considerable, a succession of small blisters applied over the part is sufficient. If it be so, the blisters should be preceded by the loss of from two to four ounces of blood from the part, from which practice, if the pulse be hard, although the tenderness be not considerable, great advantage often arises. When the disease is obstinate or has repeatedly recurred, a permanent discharge from this part, especially that by a seton, is often highly beneficial.

By such local measures the quantity of mercury required is much lessened. If the tenderness be very great indeed, no quantity will succeed without such means as more directly reduce the inflammatory action.

For the purpose of lessening the quantity of mercury, I have also combined with it such other means as tend to promote a regular and healthy secretion of bile. From this tendency of small doses of Epsom salts, they are preferable to other cathartics, provided they are equally suitable in other respects; but of all the means which I have employed with this view, I have found none equal to the dandelion. It ought always perhaps to be given in some form or other in dyspeptic phthisis. But it unfortunately tends to oppress the stomach, and can often on this account be given only in small doses, in which it is of little use. It is always proper to combine it with such bitters and aromatics as suit the case. When the stomach bears it well, so that the patient can take a decoction of it poured upon camomile flowers for his common drink, or what I have found better, two or three table-spoonsful of the fresh expressed juice in camomile tea, three times a day, its beneficial effects are frequently very striking. Advantage often arises from infusing a few cloves with the camomile flowers. When the dandelion can be given in the above ways, I often give only half a grain of the blue pill three times a day, and I think generally find as much advantage from it as from a whole grain without the dandelion. Many, I know, will regard the exhibition of such minute doses of mercury as little better than trifling; if however they make

a patient trial of them they will, I am persuaded, alter their opinion.

All purgatives seem to have more or less the effect of promoting a due flow of bile as well as of the other secretions poured into the bowels, and to this I would chiefly ascribe the great advantage derived from them in so many diseases, respecting which we have received so much practical information from Dr. Hamilton's invaluable work on purgatives.

If neither the tenderness of the epigastrium be removed, nor the gums a little affected by the above plan in about a fortnight, I have gradually increased the quantity of the blue pill till one of these effects took place. If either takes place without relieving the pulmonary symptoms, the prognosis is bad. If the tenderness of the epigastrium continue, the hepatic affection is unusually obstinate; if this be wholly removed without materially relieving the pulmonary symptoms, we have reason to believe that the disease has made great progress in the lungs. It is surprising from what states the lungs will sometimes recover when relieved from the irritation of the hepatic affection. I have seen many recover, not only whose friends, but whose physicians had lost hope of them. But in these cases the proper means had not been tried; if these have failed, the hope is no better than in other species of phthisis.

Where the failure of relief proceeds from the obstinacy of the hepatic affection, some hope arises from a fuller mercurial course, but this hope is often fallacious; for although such an alterative plan as I have recommended may be pursued without any diminution of strength, and is generally, by relieving the disease, attended with an improvement of it; a course that greatly affects the mouth, although powerful in relieving the hepatic affection, produces a most unfavourable impression on the pulmonary system by the debility it occasions. In such a case, however, it must with caution be tried, the only alternative being a certainly fatal termination.

I may here observe, nothing indeed is more evident, than that the quantity of mercury applied to the bowels, or to the skin, is a most fallacious measure of the quantity which the patient actually receives. To the skin in particular, in this disease, from the languid state of its absorbents, a great deal may

be applied and hardly any received by the system. I have often seen the patient much exhausted by the rubbing, and yet, as appeared from the state of the mouth, receiving very little of the medicine. Sometimes, when the patient bears it well, the exercise of rubbing seems beneficial; so little mercury is often received by the skin in phthisis, that I have sometimes thought this the only advantage the patient derived from the rubbing. In other cases it enters more readily. But independently of this objection, I have found the application of mercury to the skin much less beneficial than to the stomach and bowels in this disease, no doubt from its local effect on these organs and the biliary system being less perfect; so that I have of late seldom prescribed it by the skin, except when its internal use irritated the bowels, an effect which is generally prevented by the mild anodynes that are otherwise proper in almost all forms of phthisis. It is not uncommon in this disease to find the whole absorbent system so languid, that little mercury is received, even when it is given internally. It is almost needless to add, that its good, as well as its bad effects, if we except mere irritation of the bowels, depend on the quantity which the system receives.

It sometimes happens that the tenderness of the epigastrium is wholly, but the pulmonary symptoms only partially relieved by the above plan. In this case the hepatic affection is apt to recur, always bringing with it an increase of the pulmonary symptoms, till the structure of the lungs is at length destroyed. Here, if the recurrence of the hepatic affection be neglected, the fatal termination is rapid. If it be carefully watched and relieved as it appears, the case is protracted, and the decline of the patient gradual. I have known cases where the progress of the disease had by such means been so retarded, that there was little increase in it in the space of several months, prove rapidly fatal on the adoption of another plan, in consequence of the patient's coming under the care of medical men who were not aware of the history of the case. In such cases I have already had occasion to observe, the neglected hepatic affection, towards the fatal termination, sometimes produces dropsy of the belly. Under any plan of treatment these cases generally prove fatal at last; and the only chance of success is afforded by constantly watching and removing the first recurrence of

hepatic affection. It is necessary to have been in the habit of watching for it, to be able to distinguish such degrees of it as are often capable of greatly injuring lungs already diseased. Although the tenderness be very uniformly in the epigastrium, sometimes, though rarely, its chief seat is in the right side.

But the most fatal case is when the hepatic affection finally disappears, the seat of the disease being wholly transferred to the lungs, as happens frequently in the last stage of this species of phthisis. In this case there is no hope; while the hepatic affection continues to recur, there is always some hope, however small, that on its final removal, the lungs may recover themselves.

With respect to the parts of the treatment which are common to dyspeptic and other forms of phthisis, I have little to offer as peculiar to the former. I think I have found a combination of the extracts of white poppy and conium, the best anodyne in this form of the disease. Opium is more inclined to constipate the bowels and retard the due flow of bile, and the anodyne power of the hyoscyamus in such doses as are safe, is not to be depended on. When the epigastrium is very tender, animal food and fermented liquors are peculiarly injurious. Of cathartics I have already spoken.

Some suppose that mercury is often useful in other forms of phthisis. I have never found it so; but I think, when I have been obliged to employ it on account of other diseases being complicated with them, always hurtful. I have remarked that in these forms of the disease it never seems to improve the strength, as it generally does in dyspeptic phthisis, by improving the digestion. In them the digestion is generally good, and we have nothing to compensate for the debilitating effects of the mercury.

If there be any case of idiopathic phthisis in which mercury is proper, it is one which I have already had occasion to mention, in which the pulmonary disease produces disease of the digestive organs, of which we still find hepatic affection the prominent feature, and which always tends to aggravate the original disease. I have not however found it useful in such cases, which I think may be easily explained. In them the pulmonary affection is far advanced before the affection of the

digestive organs appears, and both on this account and because the former is the original disease, it cannot be removed by removing the latter. Besides, it is not likely that small doses of mercury will ever remove the hepatic disease, while the cause which produced it still continues to operate; and large doses, if they are capable of removing it, are here out of the question.

An alterative plan, conducted in the way above pointed out, I have found equally serviceable in what are called nervous diseases, when they arise, as frequently happens, from the above state of the digestive organs. Thus habitual depression of spirits, headache, palpitation and many other complaints of the same description may be relieved.

Worcester, June 18, 1816.

Extract from a Paper, by SIR WILLIAM ADAMS, *on the Restoration of Vision, when injured or destroyed, in consequence of the Cornea having assumed a Conical Form.*

[From the London Medical and Physical Journal for March, 1817.]

AMONG the causes producing short sight, is a morbid thickening of the transparent cornea, which has been usually termed Conical Cornea. One of the first, and, I may add, the best descriptions yet given of it, has been by Doctor Léveillé, an eminent French physician, and translator of Professor Scarpa's work on Diseases of the Eye, into the French language.

The conical cornea, although a disease not so frequently met with as many other morbid affections of the eye, is yet by no means of rare occurrence; and any curative effort which is capable of being successfully exerted, becomes the more interesting, the advanced stage of the disease (as far as I have been able to learn) having been hitherto considered by authors as incurable.

It is, therefore, highly gratifying, that the resources of art are found competent to afford effectual relief even in this apparently hopeless case, in which, although it is impossible to remove the disease itself, when thus fully formed, yet, by

taking away one of the healthy parts of the eye, whose use is similar to that of the diseased growth of the cornea (which does not admit of removal), vision, it will be shown, may be restored nearly to perfection.

The malady in question commences by a morbid growth of the whole substance of the cornea, but more particularly its central part, situated opposite to the pupil, and the patient's degree of short sight increases in exact proportion to this growth, which takes place without inflammation, and, in general, without opacity. Its advance, unless arrested by the appropriate medical treatment, is usually slow, but progressive, until, at length, the cornea, instead of being a regular segment of a sphere, wholly losing its natural curvature, assumes a conical form.

This change of structure produces some curious phenomena in the appearances as well as the uses of the cornea. On examining it in front, it assumes an unusual degree of sparkling brilliancy, nearly resembling crystal, except (as is sometimes the case) where there is an opacity in the apex of the cone. Doctor Léveillé attributes this brilliancy to the cornea's strongly reflecting, instead of transmitting, the rays of light; by which he supposes, that the pupil becoming contracted, in a strong light, thereby produces an imperfect and confused sight: but this explanation of the cause of the patient's imperfect vision, it will, however, be hereafter shown is erroneous. If the cornea be examined laterally, the thickening, it will be observed, gradually increases from its circumference to its centre, where the apex of the cone is usually seated, although, in some instances, I have seen it on one side of the centre. When the cornea is similarly examined, opposite to a strong light, its thickness at the base may, in general, be traced, while the sugar-loaf form of the apex renders it impossible to be mistaken for any other disease of the eye.

The change which this disease produces, in respect to vision, is very important. Soon after the commencement of the diseased growth, the patient complains of being unable to see objects distinctly, at the usual distance; and his power of vision becomes gradually shortened, in proportion as the disease advances, until, at length, he is unable to perceive minute objects

with any degree of distinctness, however near they may be placed to the eye; and cannot make out large ones when above three or four feet distant. In fact, vision is destroyed in relation to the useful purposes of life, and he becomes nearly as dependant as if totally blind. Indeed, I once saw a young lady labouring under this disease in both eyes, who did not venture to go any where without a guide.

The disease generally begins at the first in one eye, and a similar affection commonly succeeds in the other. I have met with it in almost every stage of life, from a girl of sixteen to an old lady of seventy, and am not aware that it is peculiar to any sex or age; although I have certainly seen it much more frequently in women than in men, and more in young than in old persons.

The opinions generally entertained of the cause of the disease in question, appear to me to have been incorrect, and have necessarily led to an erroneous practice, in the attempts which have been made for its alleviation. The conical form of the cornea has been attributed to an over-distension of that tunic, occasioned by a superabundant secretion of the aqueous humour, which, continually stretching the cornea, has gradually occasioned it to yield to the pressure from within, and thus produced the alteration in its form. To remove this supposed over-distension, it has been usually recommended to evacuate the aqueous humour, by puncturing the cornea, and afterwards to employ pressure—astringent collyria, &c. to prevent its re-accumulation. Experience has, however, shown the total inutility of these modes of practice. The operation of evacuating the aqueous humour has been, in some instances, repeated several times, without any permanent advantage being found to result from it; and, although it is an operation neither painful nor difficult to perform, yet is sometimes dangerous; for if the crystalline lens should be wounded by the instrument with which the puncture is made, cataract will most likely ensue; and I have been informed of a case, where this actually occurred, during the attempt to evacuate the aqueous humour.

Having, at an early period of my practice, been impressed with the opinion, that the conical form assumed by the cornea in this disease, was the effect of a *morbid growth* of that tunic;

and that the short sight experienced by the patient was to be attributed to its increased refractory power, and which, together with that of the crystalline lens, brought the rays of light to a point far short of the retina, it occurred to me, that, as it was impossible to remove the morbid growth of the cornea, without rendering it unfit for the transmission of light, a useful degree of vision might be restored by the removal of the crystalline lens. I was the more strongly led to form this conclusion, after having myself tried the experiment of looking through deep convex spectacles, such as are employed by patients after the removal of cataract; which, I found, produced a confusion of sight, very similar to that which I had heard described by persons in whom the cornea had been conical in the extreme degree. I, therefore, resolved, more than six years since, while surgeon to the West of England Eye Infirmary, instituted at Exeter, to remove the crystalline lens in a case in which that body had become opake, and also affected with conical cornea. Some circumstances, however, prevented the patient, who was a young woman, and a pauper, from being sent to me to the Infirmary. About three years since, another patient, from the country, an old woman, nearly seventy years of age, placed herself under my care, labouring under this disease, accompanied with cataracts; in whom I successfully removed both the cataracts, and had the gratification to find her vision thereby restored to an extent which far surpassed my most sanguine expectations. I observed that she was capable of seeing much more distinctly without convex glasses than is usual for persons who have undergone the operation for cataract, while, with a convex glass, she could read small print without any difficulty. Not being able to ascertain the degree of vision which this patient experienced previously to the removal of the cataracts, nor whether the diseased change was going on in the cornea and crystalline lens at the same time, I necessarily cannot state the exact amount of the benefit which she derived from the operation. This, however, was demonstrated—that, by the removal of the crystalline lens in eyes affected with conical cornea, nearly perfect vision was restored; while, it is well known, that in cases of conical cornea, where

no cataracts exist, vision is usually as imperfect as if the latter malady formed a part of the patient's disease.

The favourable result of this operation fully confirming the opinion which induced me to perform it, I determined, at the earliest opportunity, to try the effect of removing an healthy crystalline lens, as a remedy for blindness produced by conical cornea. A favourable case presented itself the following year, in a young woman, who, during six years, found her sight gradually decreasing, and, at the expiration of that period, had become so blind, from this disease, as to be unable to continue her employment as a servant, and was, in consequence, obliged to apply for parochial maintenance. Shortly afterwards she was sent to an Eye Infirmary in London, where receiving no benefit, she was subsequently brought to me, and solicited, in the most urgent terms, the trial of any practice which afforded a prospect of restoring her to sight. I carefully examined her eyes, and found that the cornea of both eyes had assumed the conical form in a great degree, attended by a slight opacity in the apex of each cone, but none whatever in the crystalline lens. She could walk without a guide, and could see at three or four feet distance, so as to avoid running against any person, but had entirely lost the power of reading, or perceiving minute objects, however nearly they were placed to the eyes.

I effected the removal of the crystalline lens, by causing it to be absorbed, which method of operating is to be preferred to every other hitherto practised, whether the lens be opake or not, in cases where, like the present, it admits of being freely divided. The patient, however, returned to the country before the eye had entirely recovered from the operation; and I did not see her again until nearly twelve months afterwards, when I was in the highest degree gratified to find her capable of discovering minute objects, and reading the smallest sized print, without the assistance of a glass, while holding the book at the usual distance of ten or twelve inches from the eye, nearly as well as she ever recollects to have done. The usual cataract spectacles for near objects, of two inches and a half focus, confused her sight nearly in the same manner as before the crystalline lens was removed, while with those of nine or ten inch foci, her capability of seeing minute objects was somewhat

improved. She saw objects at a distance better without than with any glass I could find: whereas the usual standard for distant vision, after the operation for cataract, is four inches focus. She now neither uses a glass for near nor distant objects, has again returned to service, and a gentleman told me, who has recently seen her, that she accurately described to him an object which was considerably more than a quarter of a mile distant. Twelve months after undergoing this operation, I operated upon the other eye; but she again left town before the eye had recovered itself, and before the lens was entirely absorbed. Previously, however, to her departure, she could read small print with this eye, by the assistance of a convex glass of two and three quarters inches focus, while with one of nine inches focus the sight was greatly improved in viewing distant objects.

In returning to the consideration of the case detailed of the young woman with the conical cornea, it may, perhaps, be supposed, that by admitting the susceptibility of the retina to have been increased by its being twelve months exercised after the operation, and the adjusting powers of the eye to have been acquired from the same cause, I abandoned my opinion, that the morbid degree of refraction of the light in its passage through the thickened cornea, together with the natural refraction produced by the crystalline lens, were the cause of the confused and imperfect vision previously experienced by the patient; this, however, is not the case, as the fact of the girl being capable of seeing after the removal of the lens, which was not in the slightest degree opake, after having been blind previously, shows clearly that the refractive powers (the conical cornea and crystalline) were too powerful, and that the cure was effected by the removal of one of them. But what I conceive proves the accuracy of these inductions is, that in the earlier stages of the disease, when the thickening has not attained the height it had reached in the case alluded to, the greatest assistance is afforded to the patient's vision by the employment of concave glasses. It is not, however, my intention to urge, that the refractive power is equally great in the thickened cornea as in the crystalline lens; on the contrary, I think that a convex glass of a less magnifying power than that usually

required after the removal of cataract, may be frequently employed to great advantage in cases of conical cornea. Were any further arguments necessary than those adduced to prove that the short sight of the patient is occasioned by the morbid thickness of the cornea, and not by the superabundant quantity of the aqueous humour, as has been supposed, it would be the well known fact that water possesses little comparative refractive power, while, from the dense structure and the form of the conical cornea, it is as evident that its powers of refraction must be very considerably increased. Indeed, gutta serena would certainly be produced by the backward pressure of a superabundant quantity of aqueous humour against the vitreous humour and retina, long before it would occasion a protrusion of so dense and firm a tunic as the transparent cornea; and I have actually seen gutta serena result from this cause without any material convexity of the cornea being perceptible, although, from over distention, it felt to the touch nearly as hard as an egg-shell.

Although I may have failed in convincing my readers of the accuracy of some of the opinions which I have ventured to submit in this paper, yet I have the gratification of knowing that I have fully proved the important fact, of having successfully carried into effect a mode of treatment capable of restoring vision in a case incurable by other means, and which, as far as I have been able to ascertain, has hitherto never been employed by any other person.

Observations and Cases relating to the Operation for Artificial Pupil; in a letter from Mr. Maunoir *of* Geneva, *to* Professor Scarpa *of* Pavia, *with the Professor's answer.*

[From the Medico-Chirurgical Transactions, Vol. VII.]

Letter from Mr. Maunoir, to Professor Scarpa.

Sir,

I have delayed to convey to you the assurance of my gratitude for that confidence in my skill with which you have inspired the Marquis of Beaumanoir, until I should have some

interesting information to give you relative to his case, and more especially until I should have in some degree justified your favourable opinion of me. I have been indebted to you for one of the greatest enjoyments which can be experienced; that of creating, as it were, the faculty of sight, in a person whom time had not yet accustomed to the privation of a sense so precious, and who at the same time had lost nearly every hope of ever recovering it. I am indebted to you also for other, and still greater obligations. The charm of your letters, the friendship and esteem with which you honour me, and the excellence of your instructions have been to me the most powerful stimulants. You make me love my profession with greater ardour, and excite in my mind the liveliest desire of extending its limits. I transcribe to you in the words of the Marquis himself, the following account of the origin of his misfortune; the most trifling circumstances relative to this case cannot but be highly interesting.

"In the severe winter of 1784, I was first attacked by an inflammation in both my eyes, which prevented me from performing my military duty: for five weeks I had recourse to the following remedies: blisters on the nape of the neck, foot baths, whites of eggs applied to the eyes, &c. In November, 1796, my sight was affected by a second inflammation. I had been wounded about this time, and was copiously blooded to remove a difficulty of speech caused by the effects of the wound, which was received in the stomach, grazing the left ribs. Finding myself in the course of the winter affected with an incessant stammering, the bleedings were repeated, during all which time there was a constant inflammation of the eyes. In the month of May they were restored to their natural state, and I recovered the entire use of my speech; but could neither give myself up to my professional service, nor to any thing which demanded fixed and serious attention.

"During a journey in Russia towards the end of the same year, I suffered from several slighter attacks of inflammation, which subsided without the application of any remedies. Having been obliged to pass the winter of 1798 in Siberia, the brightness of the snow, the rigour of the climate, the violence of the whirlwinds, to which I was frequently exposed, the

ardent reflection of the sun upon the snow and ice, the penetrating smoke which fills the greatest part of the habitations of this dreary country, all these causes contributed to keep my eyes, which were already weak and delicate, in a continual state of inflammation.

"In 1800, I could neither write nor read. A little while after, I was still able to perceive the light, but less with the left eye than with the right. In the month of August of the same year, during my residence at Vienna, I consulted several eminent oculists, and among others Mr. Beer, who was of opinion that my sight could be restored only by an operation on the left eye, which he performed himself, but without success. Since that period I have entirely lost the use of that eye; and the inflammation which resulted from the operation, did not subside, notwithstanding the application of every remedy, before the month of May in the following year.

"In 1806, I suffered again from another inflammation which lasted three weeks, after which time I entirely lost the power of conducting myself.

"In 1810, having become totally blind, I placed myself under the direction of Dr. Frederick at Vienna, and in the month of September of the same year, recovered the use of the right eye sufficiently to conduct myself alone. This advantage was but of short duration; intervals of more or less repose, and of severe inflammation, succeeded each other, until the year 1812, when I again totally lost my sight, preserving only the power of distinguishing, with my right eye, light from darkness.

"In 1813, I resigned myself entirely to the will of Providence, my medical advisers having declared that they could do nothing more for me. However, being at Pavia in the year 1814, I consulted the famous Scarpa, who recommended me to place myself under the direction of Professor Maunoir of Geneva."

The state of his eyes when I saw them for the first time at the beginning of April, 1815, was as follows.

They were large, prominent, the upper eyelid rather red than white, and slightly swelled; the conjunctiva covered with vessels a little too full; the iris of a bluish grey colour, and pre-

senting, instead of the pupil in the centre, a white spot of the size of a small pin's head. This spot which could only be the corresponding portion of the capsule of the crystalline, seemed to be adherent to the iris in both the eyes, and was of a whitish grey colour in the left eye, and milk-white in the right. It was impossible to decide *a priori* whether the crystalline was transparent or opake, since it was entirely hidden by the iris, and by a small portion of the capsule. The Marquis preserved the faculty of distinguishing very clearly the transition from darkness to light; but this power was much weaker in the left eye than in the right.

Saturday, 12th of August, 1815, I operated on the right eye in the following manner.

The patient being seated on a chair and having the head inclined upon a cushion, I placed myself behind him, and with the forefinger of the left hand confining the upper eyelid, whilst an assistant depressed the lower, I made with the right hand a semicircular incision in the lower and external part of the cornea. This incision occupied a full third of the circumference of the membrane. A quick movement of the eye during the operation obliged me to bring the edge of the instrument so low as to cut slightly the conjunctiva, which occasioned a slight hæmorrhage; but the application of a sponge dipped in cold water, and a moment's repose, remedied this little accident. On reopening the eye, the iris was seen projecting a little from the wound in the cornea. I replaced it with the blunt point of my scissors. Introducing the two blades closed into the anterior chamber, and then opening them, I caused the pointed blade to penetrate the iris, leaving the blunt blade between that membrane and the cornea; then closing the scissors, a perpendicular incision of the iris resulted, describing a little more than half the cord of an arc of two-fifths of the circumference of the iris, traced on the side of the temple. This first incision not having occasioned the formation of a pupil of the necessary size, I introduced the scissors into the iris a second time a little obliquely; and immediately the pupil appeared of a satisfactory form and size, but exhibiting the crystalline entirely opake.

The second stroke of the scissors had divided the capsula:

I therefore introduced a small curette, in order to endeavour to destroy what adhered of the crystalline to the shrunk and contracted circumference of the old pupil. It will be seen presently that this attempt did not succeed. Lastly I effected the passage of a portion of the opake lens by means of a slight pressure with a large scoop exercised on the lower part of the globe of the eye. The crystalline, which was of a cheesy consistence, came out with the greatest ease, and though it was not entirely removed, yet a sufficient quantity was discharged to leave the artificial pupil of a most perfect black. This new pupil was on the side of the temple, and at the exterior and lower part of the iris. The old pupil, which had neither changed in form or size, and remained always closed by a white opake body, was not comprised within the area of the new pupil, but was situated internally, and above it. The new pupil had the form of an irregular trapezium. The Marquis received immediately some confused idea of objects in the light.

The eye was reopened the fifth day after the operation. The wound in the cornea was well healed, and the conjunctiva scarcely red. The patient had suffered no pain, but when the eye was exposed to the light, he saw nothing; the new pupil which had preserved its form and size was obstructed by that portion of the crystalline which I had not been able to extract, and which was extremely swelled. I hoped however that this fragment of the crystalline would sooner or later be absorbed either entirely, or in part, and that the new pupil would in the end become black; but I was much afraid of the formation of a gutta serena. During the first three weeks after the operation, the Marquis of Beaumanoir distinguished no one object, and his despair as well as my anxiety continued daily increasing.

Notwithstanding, I saw the lower edge of the crystalline gradually disappear, and the pupil in the corresponding part become black, and yet in spite of this favourable change, the sight did not return. All at once, early in the month of September, he distinguished first his hand, then his fingers, then the houses in the street. Since this fortunate moment his sight has gradually acquired strength in proportion as the crystalline was absorbed.

At present, December 1, he can read written characters of the size of a fourth of an inch; he distinguishes the hour by the clock; he perceives at the same time the two hands of his watch; he conducts himself with ease in the street or in the road; he avoids obstacles, distinguishing men, women, children, and animals; he does not confound a willow with a poplar, or a poplar with an oak. He evidently gains something every day, and makes a sufficiently apparent progress.

The Marquis wished earnestly that I should operate on the left eye. I did it with repugnance, and not till I had warned him that I expected from it little or no advantage. September 11, I made an incision in the cornea of this eye, in the same manner as I had before done in that of the right; and at the very instant the iris came out of the wound, swelled and enlarged by the crystalline which was spontaneously displaced, so that the lens was in fact without the eye, forming a hernia of which the iris was the bag, veiling it closely, and enveloping it on every side. I gave a stroke of the scissors to the tumour, and the crystalline came out with the greatest ease, to all appearance whole, but extremely small. The iris did not re-enter spontaneously, but it was easy to restore it to its place. The pupil then appearing very small, I gave it a second stroke with the scissors, when the pupil, which was of an irregular form, appeared of sufficient size and of a perfect black.

When I examined the eye on the fifth day after the operation, I found the pupil partly obstructed by the opake capsula, and partly contracted, but still sufficiently visible in the exterior and lower part of the iris, with a small round opening of a perfect black: it appears more than probable, that if the retina had not been previously enfeebled by a violent disorder resulting from the first operation, the Marquis would have recovered the sight of his eye to a certain degree, without any difficulty. But the new pupil has remained during nearly a month, like that of an eye diseased with an amaurosis. It is within a very few days only that this eye can be said to have gained something, and the Marquis can now distinguish the moon, a lighted candle, the fire, or any bright objects which pass before him. The only forms which he has yet been able to ascertain with precision, are the square frames of his windows.

I will not attempt to give you any idea of the form of the crystalline, which remains in the right eye, because it undergoes some change every week, and because it is probable that these changes will last until its entire absorption. I might assist this operation, in making a fresh incision with a needle upon the remainder of the crystalline, but I am unwilling to cause the slightest irritation to the eye, as long as the unassisted force of nature appears to act in an advantageous manner. It will not be till the natural force appears to be languid, or rather entirely inefficacious, that I shall expose by means of an incision a new crystalline surface to the action of the aqueous humour. With respect to the iris of the left eye, there is no crystalline to dissolve, and in consequence I propose to give it shortly a sufficient extent.

I proceed to lay before you some account of two other operations for artificial pupil, of which one took place a few days before that performed on the Marquis, and the other in the course of the last month. I copy simply my notes taken at the time.

"Mr. Cherbuliez, bookseller, 46 or 48 years of age, has had since his infancy an albugo on the left eye, caused by the small-pox; it occupies a full third of the cornea on the side nearest the temple, and the rim of the pupil almost adheres to this disordered membrane, a very small portion of it is free, which makes the edge of a pupil of the size of a small grain of millet, with which Mr. Cherbuliez can only see indistinctly, with pain, and very near. The cornea of the right eye is irregularly and nearly always obscured by a species of mist which is the consequence of frequent ophthalmia. This same eye had been lately affected with amaurosis, from which it had very considerably recovered. It was but of little use to the patient. The crystalline of the left eye was evidently transparent, and it became necessary to take care of it. I operated on the third of August, 1815, in the following manner.

"The patient was seated in a chair, his head resting on the breast of an assistant, who at the same time raised the upper eye-lid. I placed myself behind him, and with the forefinger of the left hand, I depressed the lower eye-lid. I then made with the right hand a semicircular incision of about three lines in

length, and as much upon the opake part of the cornea as upon the transparent.

"I then introduced into the wound my blunt scissors, and penetrating with one of the blades through the small pupil which I have mentioned, I succeeded in making an incision without wounding the capsula or the crystalline, cutting the orbicular muscle in a transverse direction, and continuing nearly parallel between the fibres of the diverging or radiating muscle; this incision describes an entire radius of the disc of the iris. Its immediate result was a perfect triangular pupil of the most brilliant black.

"Every thing went on well during the first 50 hours, when Mr. Cherbuliez having made a violent effort in going to stool, caused a small hernia of the iris. This accident did not change the form or the size of the pupil. I have three times effected the depression of this rupture of the iris, by introducing a needle for the cataract. At present the staphyloma is little or nothing.

"Mr. Cherbuliez has resumed the ordinary course of his affairs, he writes and can read the finest written characters, nor is his eye fatigued even by a long series of occupation."

I come now to the account of the last operation which I have performed.

"A woman of the name of Saillard, 26 years of age, and mother of an infant of some months, received a thorn in her left eye, as she was cutting wood in a forest, about two years ago. She did not suffer much at the time, but the consequences of the accident were fatal to the sight of the eye. Her state when I saw her for the first time was as follows:

"The pupil, which was shrunk and irregularly fringed, and entirely incapable of any movement of contraction or dilatation, was partly covered by a spot or shell, milk-white and apparently in conjunction with the iris. Where the pupil was not covered by this body, it appeared to me at first sight black, and the woman was still able to distinguish objects confusedly with this eye. The right eye had had a cataract for nearly a year, and the pupil was immoveable and fringed, the iris appeared to have been diseased, and the watery humour had not a healthy transparence.

"Being much occupied by a press of business, and not wishing to occasion a loss of time to the patient; thinking besides that the crystalline of the left eye was transparent, and that I had nothing to do but to increase the pupil which was too small, I took with me only my scissors blunted at both points; but at the moment of the operation, and favoured by a bright day, I perceived that the crystalline was decidedly opake, though at the same time in such a manner, that I could easily have supposed it to be transparent the first time I observed it, and especially in a situation where the light was not favouable.

"It was now evident, however, that it was necessary to extract the crystalline, and that if I enlarged the pupil with my blunted scissors, it could only be by cutting the iris in the upper part of its disc, an operation which would render the extraction of the crystalline difficult, and even perhaps impossible, since it was probable that some extraneous substance would adhere to it. In consequence of these considerations, I made my decision instantly, and performed the operation in the following manner:

"I first made an incision in the lower part of the cornea; then introducing the point of my instrument into the lower part of the iris, the puncture gave me an opening of the size of a pin's head, sufficient to allow the passage of one of the blunted points of my scissors, with which I cut the narrow strip comprised between the hole caused by the knife and the natural pupil; I then obtained immediately a pupil of a good size, and which exhibited a crystalline humour of a whitish grey colour. Then observing that the compression which I exercised upon the eye appeared in no degree to move the crystalline, I passed behind it a very small scoop, and drew it out of the eye by this means, with the greatest facility. The pupil was then of a perfect black, but the white spot had changed its situation and now obstructed the lips of the wound in the cornea. After having endeavoured in vain to remove it with the scoop, I was obliged to seize it with the forceps, by which means I drew it out, together with a transparent membrane which adhered to it, and seemed to detach itself from the iris: it proved on examination to be that of the crystalline. The white body was of the size of a lentil, and entirely of a cartilaginous nature. The patient

saw immediately, and distinguished perfectly every object which I presented to the eye, but they all appeared coloured with a tinge of blue.

"Six days after the operation, I showed the woman to my society of medicine, where she was seen by Messrs. Odier, Peschier, Aubert, Colladon, De Roches and Morin. The cicatrix of the cornea was in a healthy state, the pupil of a good size and of a perfect black, the sclerotica was scarcely red, and the patient saw very small objects tolerably well. She returned to her house at Chable the next morning, seven days after the operation."

I have the honour to be, &c. &c.

J. P. MAUNOIR.

Geneva, December, 1815.

Letter from Professor Scarpa to Mr. Maunoir.

SIR,

I have received with the highest satisfaction the account with which you have favoured me of the success of your operation on the Marquis of Beaumanoir. It gives me great pleasure to have been in any degree instrumental to the service you have rendered him, and I request you to present to him my hearty congratulations.

Every lover of the science cannot but feel interested in the narration of the difficulty which attended this operation, as well as that performed on Mrs. Saillard, on account of the opake crystalline, which in both cases adhered to the lower circumference of the iris, and the edge of the closed pupil. This has given me occasion to make some reflections on the subject, which I take the liberty of communicating to you with my usual freedom.

The detail of both the operations in the above mentioned cases, exposes a certain degree of difficulty and uncertainty in the proceeding, which I should wish to see removed or corrected; and I have great hopes that you will be able to attain this desirable object.

In the first place, I am of opinion that it is not necessary to be scrupulous whether the crystalline be partly or entirely

opake, whenever the capsule is opake, and adheres to the iris behind the edge of the anterior and inclosed pupil. In this case, only one remedy can be pointed out, namely, the removal of the opake adherent capsule, and consequently of the crystalline, whether it be transparent or opake.—In the second place, I think there is no reason to doubt that, in similar cases, it is adviseable to make an incision upon the iris proportioned to the size of the body to be extracted, rather than to make it small, which obliges the operator to divide the crystalline and the capsule, with the intention of extracting a part, and of abandoning the rest to the powers of absorption.—Thirdly, I would establish as a fundamental principle in similar cases, that after the complete extraction of the crystalline with its opake capsule, by means of the least possible introduction of instruments, the artificial pupil ought not to be too near the incision in the cornea, and, consequently, not too near the cicatrix occasioned by it.

The causes of the obstacles, to which you were exposed in the two cases above mentioned, may, I think, be perceived from a consideration of the principles I have just stated. In both the incision in the iris was too small in proportion to the size of the body to be extracted; and in both, the position of the artificial pupil was very disadvantageous; that is to say, on the side of the temple and close to the incision in the cornea.

After reflecting attentively upon this situation of the artificial pupil, and upon the obstacles which it presents to the operator, it appears to me, if I am not greatly deceived, that a method of operation compounded of that of Wenzel, and of your own, would perfectly answer the desired end. Wenzel, as you are aware, made an incision upon the cornea and the iris with a single stroke of his instrument, taking care that this transverse incision should pass through or underneath the centre of the inclosed pupil. He then took off, by means of the scissors, a portion of the edge of the iris, for the double purpose of extracting with facility the opake crystalline with its capsule, and of leaving a permanent artificial pupil of sufficient size. In the method which I would suggest, after having made, in the manner of Wenzel, a transverse incision in the iris and in the

cornea, I would introduce your scissors, blunted at both points, into the anterior chamber of the aqueous humour, with which I would make an incision in the iris, diverging from the cut made by the knife, so that your usual triangular edge might be the result, having a curvilinear side. This aperture, which requires only a single stroke of the scissors, will be, I think, sufficiently large to allow easy egress to the crystalline and the capsule; and this so much the more easily, in proportion as the point of adherence of the capsule to the iris, is comprehended either entirely, or in a great measure, within the two incisions. By this means the facility of making the crystalline and the capsule pass obliquely out from the iris will be increased on account of the enlarged space that will result from the cut with the scissors diverging from that made by the knife; and I should prefer this incision with the knife to the puncture made by you in the iris of Saillard, to afford a passage to the blade of the scissors. Besides this, the direction and the situation of the triangular edge of the iris will be calculated to leave a pupil not only permanent, and sufficiently large, but also placed opposite to the cut in the cornea, and accordingly more convenient for the purposes of vision; especially if it fall upon the side of the iris nearest the nose, which ought, if possible, always to be the case.

I have thus briefly given you my opinion on this subject. You will recollect that you permitted me to make objections and suggestions. I have done so; and it now belongs to you in the course of your practice to make trial of the method I propose, and either to confirm or reject it; or, which will not be difficult to you, to suggest some new and more practicable expedient. It is certain that this complicated case of the pupil, that is to say, where the crystalline is found opake, together with the capsule adhering to the iris, requires an exertion of genius and skill, united to a more perfect method of operation, than that which has been hitherto practised. Your researches have already been so numerous and so successful in this branch of our profession, that we have a right to expect you to proceed in the completion of your work. Till within a very few years, our knowledge respecting the artificial pupil, and the

method of conducting the operation, was involved in great obscurity, and practice was sometimes even in opposition to the known anatomy of the eye. It is by solid and fixed principles alone that we ought to be guided in all that variety of complicated cases, which frequently accompany and aggravate the inclosed pupil. In estimating the extent of the services which you have already rendered to the profession, I run no risk of error in enumerating the following facts as the results of your most useful researches.

1. That no instrument is so proper as the scissors for making an incision in the iris.

2. That to do this, when there is no complication resulting from a cataract, a very small incision in the cornea is sufficient, about half the size of that which is made for the extraction of the crystalline,—a fact which on many accounts is of the highest importance.

3. That the formation of a triangular edge in the iris by means of a double incision with the scissors, is the most easy and least painful of all the methods hitherto proposed for obtaining a *permanent* artificial pupil.

4. That the spots of the cornea present no obstacle, because it is possible to produce the artificial pupil in that part of the cornea remaining transparent, in the quarter opposite to that in which the incision is made,—a fact of the greatest importance.

5. That it is possible to obtain the artificial pupil without injury to the crystalline or its capsule, whenever these parts are preserved transparent, in spite of complete confusion in the iris.

If to these advantages, which your method of operation possesses over all those hitherto practised, you are able to add that of rendering as little laborious as possible the manner of making the artificial pupil, in those cases where it is necessary to remove at the same time the crystalline and its opake capsule adherent to the lower surface of the iris, you will fulfil not only all my wishes, but those of all who are interested in the cause of humanity, and in the progress of science. The state of my health does not permit me to follow you in this useful career, and leaves me only the power of witnessing and of ap-

plauding your success. I have much pleasure in informing you that your scissors have begun to be used here, and Signor Morigi, my successor in the chair of surgery, has lately availed himself of them with great success in an operation for the artificial pupil. He is a man of considerable ability, whom you will find mentioned with deserved praise in several places of my work.

I have the honour to be your most sincere friend and humble servant,

A. SCARPA.

Pavia, Jan. 1, 1816.

SELECTED REVIEWS.

1. *An Inquiry into the Causes of the Motion of the Blood, with an Appendix, in which the Process of Respiration and its connection with the Circulation, are attempted to be elucidated.* By James Carson, M.D. Physician to the Workhouse, the Fever Hospital, and to the Asylum for the Pauper Lunatics, at Liverpool; and in charge of the Military Hospital at that place. Liverpool, 1815. 8vo. p. 250.
2. *An experimental Inquiry into the Nature, Cause, and Varieties of the Arterial Pulse, and into certain other Properties of the larger Arteries in Animals with warm Blood, illustrated by engravings.* By Caleb Hillier Parry, M.D. F. R. S. &c. &c. Bath, 1816. 8vo. p. 180.

[From the Annals of Medicine and Surgery, for June, 1816.]

None but Hutchinsonians would in these days deprive Harvey of the honour of having discovered the greater circulation of the blood.* They, resolved to make the Bible a complete system of natural philosophy as well as of religious doctrine, regard the 6th verse of the last chapter of the book of Ecclesiastes as satisfactory proof, that Solomon was acquainted with the circulation. We do not imagine that any of our readers, whether acquainted with Mead's exposition of the paragraph or not, are infected with so absurd a prejudice.†

Although the second centenary of this discovery will in three years arrive, strange it is to say, and much stranger would it be, if the Hutchinsonians were correct, that the means by which the circulation is accomplished, have been to the present moment all but entirely unknown. The heart, it

* The lesser, or pulmonary circulation was known to the Italian physicians.

† Mead well explains the whole metaphorical account of senile decay. The passage alluded to runs, "Or ever the silver cord be loosed, or the golden bowl be broken, or the pitcher be broken at the fountain, or the wheel broken at the cistern."

is certain, propels the blood with great force into the aorta; but how far this force operates, what assistance the arteries contribute, what the veins, what various attendant circumstances, is all uncertainty and confusion to the student, whether listening to his teachers, or studying physiological writers. We rise from Hunter little more satisfied than from Haller, and from Bichat little more satisfied than from Hunter. Curiosity, unaccompanied by hope, induced us to look into Dr. Carson's book. We were soon agreeably surprised, and although no inconsiderable effort of attention was required, we perused the whole work with the greatest satisfaction. We consider it the best physiological work upon this subject. In our last number we presented our readers with a review of many important additions to our knowledge of the functions of the nervous system, and it is gratifying to be able to present them in this number, with a review of some additions to our knowledge of those of the sanguiferous, and procured too without the torture or the murder of a single animal. "It is," says our author, "perhaps to a censurable degree, the fashion of the philosophers of the present day, to aspire after distinction by the number and variety of new experiments, rather than by weighing well the tendency and value of those which have been already made."

The work is written with great neatness and perspicuity, and although it has been censured for containing anatomical detail, we can scarcely blame it on this account; for of all our elementary knowledge, anatomy is forgotten the soonest, and most medical readers, we believe, require their memory to be refreshed while listening to physiological arguments.

It is divided into three parts. They contain,

1. An enumeration and estimate of the causes which have been supposed to promote the circulation of the blood.

2. The developement of other causes which appear to contribute to the motion of the blood; and which, added to the preceding, will, it is presumed, be found adequate to the effect.

3. An explication of phenomena.

There is likewise an appendix, containing a brief explanation of the mechanism of respiration, and of the connexion

which is supposed to subsist between it and the circulation of the blood.

We shall be pretty full in our account, as the perusal of the book itself, however gratifying and beneficial in many parts, requires stronger attention than many medical readers possess the powers or the leisure to bestow.

1. It was contended by Harvey and his followers, and the opinion still prevails, that after contraction, the right auricle is dilated by the force of the blood returning to it by the veins, and that the ventricle is dilated by the force of the blood impelled against the internal surface of its walls by the contracting auricle. The force of the blood returning to the heart, Harvey and many others supposed to be derived from the contraction of the left ventricle. But whatever may be the impetus given to the blood driven from the left ventricle, it must in the course of circulation be diminished and expended according to the common laws of motion. If the circulation is produced by the impelling powers of the ventricles alone, either each particle of blood issues into the aorta, with momentum sufficient for its progress, and its return to the right auricle with the degree of momentum which it is known to possess on its return; or, as the sanguiferous canal is full of blood, the additional quantity thrown in at one end, must force out a corresponding quantity at the other. The first supposition is inadmissible, because it is impossible for a body endowed with a certain degree of momentum, to retain it undiminished through a long course, subjected to many powerful resistances. The second supposition is inadmissible, when we consider that the quantity of blood is nearly one fifth of the weight of the body, that it is spread over an immense surface, and consequently exposed to great friction, especially in the small vessels; that the currents on account of the anastomoses are perpetually flowing in opposite directions; it is impossible for all this labour to be executed by the propelling power of the ventricles—the root of the aorta exposed to the full undiminished amount of this force, would at every pulsation have been in danger of rupture. In this case too, it would have been necessary for the whole sanguiferous system to have been in a constant state of great distention, otherwise the admission

at one extremity would not have been necessarily attended by a corresponding expulsion at the other, yet the veins are evidently but little distended, as the great swell consequent upon the application of a ligature to any of them proves: besides, any considerable loss of blood, diminishing this general tension, would have destroyed the circulation. Among minor arguments, Dr. Carson mentions the circumstance of the hearts of animals not being in proportion to the bulk of their bodies, as the sole dependence of the blood's motion upon the heart would have required. But it is to be remembered, that the size of the heart is rather in proportion to the quantity of blood to be moved, and indeed the force with which it is to be moved, and that the quantity of blood is not always in proportion to the size of the body. "The right ventricle is equal in size to the left, if not larger, which sends its blood to the lungs only, which are infinitely small when compared to the body; and the hearts of those animals which have but one ventricle, as fish, for instance, which is similar in use to our right, are perhaps made as large in proportion to the size of the body as both ventricles in the quadruped.*"

As the heart appears unable alone to maintain the circulation, let us examine whether the arteries are able to supply the deficiency.

The pulsation of arteries during the contraction of the left ventricle, was considered a proof that the dimensions of them were increased, and their elastic and muscular coats were conceived to restore their original capacity. But less force would be gained than was imagined, because as much must have been expended in dilating the elastic coat, as was gained by the effective exertion of its elasticity. Dr. C. considers nothing to be gained; but surely, granting the dilatation, which, on reviewing Dr. Parry's work, we shall find reason to doubt in the larger arteries, the muscular contraction of the arteries would add to the momentum of the blood. Weitbrecht of St. Petersburgh objected, that the small quantity emitted from the left ventricle at each pulsation, was insufficient to produce the general distention, and physiologists were under the necessity

* Hunter, on the Blood, &c. p. 141.

of supposing, that the quantity propelled into the beginning of the aorta caused it to dilate, and by a succession of dilatations and contractions, caused a rapid but successive dilatation of the whole arterial system. Granting this mode of explanation, certain reasons appear to justify the conclusions, 1. "That the *vis a tergo* or force derived from the heart and arteries, is insufficient to balance and keep in motion the whole blood in the venous system. 2. That from various phenomena accompanying this part of the circulation, the motion of the blood, as it exists in the veins, could not be produced by any power alone, however strong, that was so directed."

1. "If we take into consideration the quantity of blood in the veins, it will appear too great to be sustained and kept in motion by the contractions of the last part of the arteries alone. The veins are supposed to contain at least twice as much blood as flows in the arteries. But the weight of this mass, upon the supposition of its being balanced and advanced by an impulse from the ends of the arteries, is enormously increased by the form of the vessels in which the fluid to be moved is contained, and by the position of these vessels in relation to the moving power. The veins, as has been mentioned, ramify from trunks which arise from the heart, after the manner of the branching of a tree. The area of the transverse section of all the branches united, continually increases the further this section is taken from the heart; and at the ends of the veins, at which the impulse must be made upon the blood, the area of the transverse section is the largest of all. The blood therefore, in approaching the heart, is constantly passing into a narrower channel. Its motion is expended not only on the column of blood before it, but upon the contracting sides of the channel along which it moves. So that in fact, the impulse necessary for advancing the blood in the veins would not have the weight of the blood before it, alone, to support, but the weight of a cylinder of blood, the base of which is equal in area to the transverse section of the veins at their ends, and the height is the distance between this section and the heart. The form and position of the veins, are therefore the most unfavourable that can be conceived to the motion of the blood, upon the supposition of its being totally advanced by a *vis a tergo*." "The veins

form frequent anastomoses. By the collision of currents meeting at considerable angles, the momentum of each is to a certain degree expended."

2. "But allowing that the heart and arteries were sufficient to advance such a quantity of blood under all the impediments to which it is subjected, the veins are evidently not fitted for their supposed office. They must be allowed to be always in an extreme degree of distention. In the lower extremities, particularly in the erect posture, they would necessarily have to sustain such a degree of lateral distention as their coats could scarcely be supposed to resist. The valves, with which these vessels are furnished, admitting them to be as perfect as possible, could not remove this pressure at all times; for they must be opened by the force of the blood advancing to the heart, when the vein would have to sustain at any part the weight of a cylinder of blood, of which the base was equal to the square of the diameter of the vein at that part, and the height to its distance from the heart. But the veins, even in the lower extremities, do not appear to sustain any considerable degree of lateral pressure. When slightly pressed, they swell on the side of the point of pressure farthest from the heart, to a considerable size. They certainly therefore, in their ordinary state, are not in the situation of rigid tubes; which they must be admitted to be, upon the supposition of the blood being advanced through them by a force impressed upon this fluid at their distant terminations. Besides, a vein wounded in these circumstances, would never cease to flow while there was any blood in the part of it between the orifice and the heart, which would be nearly as long as there was blood in the system."

There is no proof of any propelling powers in the larger veins, whatever may be supposed in the smaller, in common with all the capillaries. That voluntary muscular motion is not necessary to the blood's motion through the veins, is shown by the continuance of the circulation during rest; and the pressure of the dilated arteries upon the veins, spoken of by many writers, and even by Mr. Hunter, must be first proved to occur, and secondly to possess the power which is ascribed to it. Indeed an increased velocity in the motion of the venous

blood, from compression, whether by muscles or arteries, is very problematical. The muscular contraction which drove the blood flowing between the centre of pressure and the heart, with augmented impetuosity, would close the valves against the blood that was coming from the extremities, and bring for a time to rest the whole current that was in motion, between the shut valves and the ends of the veins; and as the space into which the venous blood flows is gradually becoming smaller, arterial compression would rather drive the blood backwards into the greater space, than onwards where the resistance is stronger. The acceleration of the pulse by exercise, must be otherwise accounted for. Dr. Wilson (*Inquiry into the powers employed in the circulation of the Blood*) suggested, that during the relaxation of the heart, the blood would be sucked up by it from the *venæ cavæ*, and the circulation thus importantly promoted: and although Dr. Wilson did not substantiate his opinion, we shall find it to be true, and in fact to be the ground-work of all Dr. Carson's doctrine.

2. We come now to the peculiar doctrines of the author. The chief, in short, amounts to this,—that the lungs being very elastic, prevent the effect of the atmospheric pressure to a great degree upon the heart, while the blood of the veins, being in common with all other parts of the body, exposed to the full force of this pressure, is thereby driven into the auricle the moment its contraction ceases, thus constituting an antagonist power to the muscular contracting power.

The substance of the lungs is known to be eminently elastic. By bending and plunging the trachea of slaughtered animals into water, and then puncturing each side of the chest, a quantity of air was expelled from the lungs, capable of supporting a column of water several inches in height. This shows the lungs to be in a constant state of forced expansion, otherwise the pressure of the air admitted into the cavities of the chest would not produce collapse. How great their elasticity is, we do not know, because the force with which they acted upon the last portion of air within them, in Dr. Carson's experiments, was of course much less than it would be when they were fully dilated, as the resistance given by elastic bodies to a stretching or dilating cause, increases with every addition

to that cause. The lungs, therefore, afford great resistance to the atmospheric pressure. The heart must constantly experience this diminution of pressure, and when its fibres relax, the blood must of necessity rush into it, viz. where there is least resistance, and will be thus drawn from the *venæ cavæ* into the right auricle.

"By removing, therefore, in consequence of their elasticity, a part of the pressure of the atmosphere from the convex surface of the heart, and by that means causing the ordinary pressure to ponderate unequally against the concave surfaces of the chambers, the lungs become the certain and powerful antagonists of the muscles of the heart. The contractile force of the heart is necessarily more powerful than the antagonist action derived from the elasticity of the lungs, but the former is transient and interrupted, while the latter is equal and permanent; during the intervals between the exertion of the muscular energy, it becomes predominant; and co-operating with the natural tendency of the structure, restores the chambers of the heart to the state from which they had been forced, and at which the superior strength of the contractile power begins again to be exerted."

The circulating powers are thus described in a recapitulation which closes the second part.

"By every contraction of the ventricles, a quantity of blood is projected forcibly into the great arteries. As the coats of the arteries are dilatable, these vessels give way to the impetuosity of the propelled blood; and, to a certain distance from the heart, become of a more enlarged calibre. In consequence of the stimuli derived from the blood newly admitted into the arterial cavity, and (if so bold a metaphor may be used) from the pain of distention, the irritability of the muscular fibres is excited, and co-operating with the elastic, restores the artery by a rapid movement to its former dimensions. As the blood is an incompressible fluid, a quantity, equal to that projected from the heart, must now be displaced from that portion of the arterial system, which had been dilated by the immediate impulse of the ventricles. The valves, which are stationed at the roots of the great arteries, and which are securely closed, during the contraction of the first portion of

the arterial system, by the retrograde movement of the blood nearest the heart, and more effectually by the suction occasioned by the synchronous dilatation of the ventricles, completely prevent the return of any fluid from the arteries into the heart; while the more ample calibre possessed by the aggregate of the vessels beyond the contracting portion, and the distensible condition of their relaxed fibres at the moment, favour its advance into a more distant portion. This portion, now distended and stimulated by the same causes by which the first had been excited, recoils vividly upon its contents; and, by the rapid resumption of its former capacity, expels from its cavity a quantity of blood equal to the addition which it had received during its dilatation. The blood, displaced by this movement, from what may be termed the second portion of the arterial system, is directed into a more advanced part of it, by the different state of the coats of the vessels, and the difference between the agregate of their calibre before and behind the contracting portion; because, in consequence of the rapidity of the vibratory undulation, the coats of the vessels between the contracting portion and the heart are still rigid, while those beyond it are relaxed and easily dilatable; and because the outlets on this side are greater as the aggregate of the bores of the vessels increases with the distances from the heart. The same series of actions is repeated to the ends of the arterial system. A quantity of blood, therefore, equal to that which had been projected from the heart into the arteries, is propelled from the ends of the arteries into the veins in equal times. The power of the heart may be thus said to be transmitted undiminished to the end of the arterial system.—No data were discoverable from which the momentum of the blood discharged from the ends of the arteries, or the quantity of motion it would generate in the venous blood, could be estimated. But from the mass of fluid that was to be put in motion; from the velocity with which it was known to flow; from the form and position of the vessels containing it; from the resistances opposed by friction, tenacity, and various other causes; and from the phenomena attending the venous circulation, it was concluded with the fullest confidence, that the blood could not be circulated through the veins by the impulse it received

from the arteries alone.—In searching for the causes by which the chambers of the heart were dilated after contraction, it was ascertained, that this condition of the organ was in part to be ascribed to the form and position of its fibres, in consequence of which, simple relaxation was accompanied by a certain degree of dilatation, but particularly to the supporting of a part of the atmospherical pressure that would have rested upon the convex surfaces of the heart or its envelope, by the resilient or collapsing effort of the lungs. It was urged, that the abstraction of a part of the ordinary pressure of the atmosphere from the convex or external surface of the heart, or from the convex surface of the pericardium, was perpetual, and was therefore always ready to co-operate with the dilating faculty of the heart itself, as that was alternately renewed: and that the conjunction of these powers was fitted during the intervals of contraction to dilate the chambers, to the utmost extent, or at least to the effect of the capacity of the pericardium.—In consequence of the dilatation of the ventricles by the causes which have just been stated, the valves at the roots of the arterial trunks, yielding to the greater pressure from without, become securely closed, and the resumption of blood by the heart from the arteries, is completely prevented; but the passage of blood from the auricular into the ventricular cavities is not obstructed; the blood, therefore, by which the former chambers were dilated, pursues the less resisted course and occupies the space left by the dilating ventricles. Any deficiency in the full dilatation of the ventricles, which in the healthy condition of these parts can scarcely occur, will readily be supplied by the projectile force of the contracting auricles. By the dilatation of the auricles, the valves, in the auricular passages, sustaining less resistance on their internal surface, become securely closed; but at the other openings, those by which they communicate with the venous trunks, is relieved from a part of the ordinary pressure in the direction of the heart; it necessarily takes the course in which it meets with the least resistance, and continues to move in that course until the resistance is equalized by the full dilatation of the auricles.—The heart, therefore, acts at once in a two-fold capacity. By the contraction of the ventricles it propels the blood through the arteries,

and by the dilatation of the auricle it pumps it from the veins. It is at the same time a forcing and a suction pump.

"The structure of the veins is not fitted for raising blood through them to the heart, from parts at a distance from that organ, by suction alone. For these vessels being very thin and pliant, would immediately collapse and become impervious under such influence: other agents are required to preserve the permeability of the venous vessels, to give them as it were the property of rigid tubes, and to bring the blood which they contain generally within the sphere of the action of the heart. For this purpose two causes are supposed to operate. The first, to which allusion has already been made in this recapitulation, is derived from the projectile power of the ventricles, transmitted by the vibration of the arteries to the ends of the veins. This is the *vis a tergo*, so famous in the schools of medicine. We were unable to estimate the share of the venous circulation that is to be attributed to this cause; which, however, so far as it extends, is evidently well fitted to co-operate with an abstraction of resistance in front, and to preserve uninterrupted the communication between the blood in the remote parts and the heart. The other power, which was supposed to assist in preserving the distention of the venous vessels, in opposition to the suction influence of the heart, was gravity. By the anastomoses which so generally prevail among the veins, particularly among the smaller ramifications, the system of the *vena cava* may be considered as a single canal. By its retiform fabric, the communication between the blood in the different branches, by the aggregate of which any portion of this canal is formed, is preserved as ready and free as if the blood had flowed in that portion, in a single unpartitioned channel. The position of the vessel is fixed. At the moment in which the equilibrium between the contents of the vessel may be supposed to have been adjusted, a quantity of blood is abstracted from one end of it by the stroke of the heart, while a quantity is added to the other by the synchronous contraction of the ultimate portion of the arteries. The balance between the opposing columns of fluid is disturbed; to restore the equilibrium, deranged as the actions of the heart are renewed, a motion is generated in the blood by gravity, from the ends of the veins to their roots. In short, the motion

of the blood while it flows in the veins is produced by the force of the heart and arteries urging it behind; by the abstraction of a share of the atmospheric pressure from it in front, in consequence of the resiliency of the lungs interposing its influence in the intervals between the contractions of the heart, and by gravity, which is rendered available in this case by the projection of the arteries and the diastole of the auricles."

The statement of the dilatation and contraction of the larger arteries we shall afterwards examine, but we differ from Dr. Carson in regard to the diminished atmospheric pressure acting as an antagonist to the ventricles and to the auricles. While the diminished weight facilitates the passage of the blood into the ventricles, it tends equally to retain it in the cavities from which it flows into them, and renders a proportionally greater exertion of muscular contraction necessary; but as the pressure on the blood flowing from the *cavæ* into the right auricle and the pulmonary veins into the left is undiminished, there it does really act as a powerful antagonist—and there such a power is necessary, as neither *cavæ* nor pulmonary veins possess propelling muscular powers, whereas the auricles are strongly muscular, and in all appearance able to distend the relaxed ventricles with their blood. The slighter degree of suction of the ventricles in common with the auricles, from the mere relaxation of their fibres, first pointed out by Dr. Wilson, we would not deny. The effect of gravity appears overrated, for although it may equalize the blood of many veins, how can it equalize that of the iliacs, for instance, and the *cavæ* during the erect posture.

3. The suction influence of the heart upon the venous blood explains, and it alone can explain, why a punctured vein does not bleed unless a ligature is thrown upon it between the puncture and the heart. In taking its course out of the orifice, the blood would have to surmount the resistance which the whole weight of the atmosphere opposes; but in flowing along the channel of the vein, it is relieved from a share of that resistance, and it necessarily takes that less resisted passage. The same influence explains why a tied vein becomes empty between the ligature and heart. It also explains why if only one vein of the arm, for instance, be tied, it does not swell

much, and if punctured affords but little blood: the direct road for the returning blood is interrupted, but the suction influence of the heart operates indirectly by anastomosing veins, and the blood is thus drawn to the heart, although circuitously; the greater degree of swelling will depend upon the smaller number and capacity of the anastomosing branches. The absorption of blood from the cells of the penis after erection, and from the uterus after delivery, nay even the formation of new vessels in the coagulable lymph interposed between two surfaces, Dr. C. similarly accounts for.

"When a wound is made in the body, and the parts brought together and kept in that state, the plastic nature of the blood that had oozed out of the arteries drying near the surface, unites the edges of the wound. But the blood oozing out of the arteries remains liquid. The veins in the meantime have become emptied, in consequence of the blood which they contained having taken the less resisted course, and returned to the heart. The blood then which had flowed from the mouths of the arteries into the interstices between the divided surfaces, being less resisted towards the mouths of the veins than in any other direction, necessarily enters the veins and continues its course to the heart. Other blood follows, and thus a communication is established between the artery and the opposite vein. The blood forming this slow current coagulates upon the external surface, and in due time a vessel is thus formed between an artery on one side and a vein on the other of the wound."

Where a tooth or a piece of flesh is transplanted, and communication of course cut off on one side, the vessels are supposed to preserve their perviousness, and "if therefore a diminution of pressure, which was previously equal, be made at one end of a small incompressible tube, and if the other end of a tube be inserted in a liquid, a current will necessarily be produced, from one end of the tube to the other.

Is not this *ultra rem intendere?*

The suction of the auricles shows why valves are not necessary at the openings of the veins. The blood of the veins is supported by the atmospheric pressure; this is diminished in regard to the ventricles, and the blood being compelled to flow where the resistance is least, cannot on the contraction

of the auricles regurgitate into the veins: on the contrary, when the ventricles contract, the blood without valves at the auricucular openings would regurgitate into the auricles, as the atmospheric resistance is less there than in the arteries; and when they relax, would without valves at the arterial openings experience regurgitation themselves from the arteries, on the same account. The fainting experienced on ascending elevated situations, is accounted for by the diminished weight of the atmosphere at these heights being unable to support the column of blood in the *cava inferior*, and transmit it to the heart with the usual force. The instantaneous relief obtained by the horizontal posture accords with this explanation. The same diminished pressure must produce the redness of the skin and the bleeding at the lungs mentioned by Saussure. Unless the blood were thus drawn up through the veins, it is impossible to conceive their thin coats capable of sustaining their columns of blood, as they do, and without even being much distended.

We come now to the appendix. As the resistance offered by the lungs against the pressure of the atmosphere, by relieving the heart from a degree of it, causes the venous blood to be propelled into it, so the same circumstance causes the diaphragm, the instant it is relaxed, to be driven upwards towards the chest. The vacuum which would occur is prevented by the entrance of blood and the ascent of the diaphragm, and affords an antagonist to the contractions both of the heart and diaphragm. As the heart after being distended by the blood contracts, so the diaphragm after being driven upwards contracts, and the elastic lungs become forcibly dilated by the air on account of the threatening vacuum in the thoracic cavity. The diaphragm ceasing to act, the elasticity of the lungs immediately expels the air, and the atmospheric pressure distends the unresisting diaphragm. The same applies to the intercostal muscles.

An objection presents itself against the assistance required by the heart from the elasticity of the lungs, on considering that the functions of the heart are performed in the fœtus, whose diaphragm is supposed to be in a state of complete relaxation, and therefore so drawn up into the chest as completely to fill the space which would be left by the undistended

lungs. This objection Dr. Carson endeavours to remove, by suggesting, first, that the circulation in the fœtus is not required to be very vigorous, from the paucity of secretions, the supply of heat afforded by the mother, &c. and therefore that the slight vacuity left by the mere relaxation of the heart's fibres is sufficient; and secondly, that the diaphragm most probably is not so stretched but that it is making a constant effort to contract, and to a certain degree succeeds, leaving a certain share of vacuum in the chest, which the venous blood is drawn into and destroys. Now, in the first place, we think the circulation in the fœtus is vigorous enough to require the assistance derived from the relief of pressure upon the heart, unless the suction from the mere relaxation of the heart is greater than Dr. Carson conceives; and, in the next, allowing the explanation to be satisfactory in regard to the human fœtus*, it cannot hold good in regard to the fœtal bird, which has no diaphragm. If this review should meet Dr. Carson's eye, we request himas a favour to explain his ideas of the heart's action in birds and reptiles, which have no diaphragm, and whose respiration is not therefore carried on by a vacuum formed or threatened in the chest, but simply in the lungs. The structure of these animals inclines us to believe that Dr. C. has overrated the effects of the diminished pressure upon the heart, and underrated the suction influence of the mere relaxation of the muscular fibres, suggested by Dr. Wilson.

Mr. Hunter remarked (*on the Blood, &c.*), that the muscular coats of arteries bore a greater proportion to the elastic as the vessel was more distant from the heart. Bichat absolutely denied muscular power in any but the capillaries, and Berzelius was unable to discover any fibrin in what is called the muscular coat of arteries. To ascertain whether arteries possess the properties of muscular parts, Dr. Parry repeated an experiment of Mr. Hunter's. Two ligatures were made upon an umbilical chord, before its separation from the fœtus. The

* The case of the fœtus appears to us exactly the same as after birth. The lungs being undistended, a vacuum is threatened, but is prevented by the ascent of the diaphragm and the entrance of venous blood, which will besides regularly enter exactly in proportion to the space left by the successive exits of arterial blood.

blood being thus retained, and a fresh ligature being made the next morning at some distance from the remaining one, all the vessels appeared turgid with blood.

"The placenta being then placed below, and the chord held up in a perpendicular direction, so that no blood could escape by its own gravity, the chord was cut through between the ligatures. The blood immediately sprang out with considerable force, and even for some short time continued to ooze from one of the arteries, leaving the orifices of both much more patulous than in the two former experiments (made immediately after the separation of the chord). Another ligature was made farther on, and the intervening part cut through, with precisely the same effects as before. All the portions thus divided were put into clean water, and laid aside until half past five on Sunday. The various sections being then examined, no difference in the size of any of the arterial orifices from that of the preceding day could be perceived. So far indeed were these arteries from being fully contracted, that some of them still contained blood. The result of this experiment, therefore, differed from that of the two former, inasmuch as the tonicity of the arteries seemed to have been totally or nearly lost, previously to the several sections."

In various other experiments, arteries were exposed, and their circumference accurately measured. On killing the animals, the circumference was instantly diminished, and after the lapse of nearly or more than a day, increased again, showing the muscular powers of the vessels, contracting like other muscles on death, and losing their power with the cessation of vitality. By bleeding animals to death the arteries become at first extremely contracted, though from the debility necessarily ensuing, the loss of the contractile powers, and the consequent dilatation by the elasticity of the vessels, sooner occurred than in death produced in other modes. The arteries thus appear to possess a muscular and an elastic power, and to be during life in a state of forced distention. In order to enquire further into this point, two ligatures, distant from each other an inch and a half, were at the same time drawn tightly upon the carotid of a living sheep. The vessel half way between them was $\frac{200}{400}$ of an inch in circumference; the blood being let out of the

included portion by a puncture, the same part measured but $\frac{160}{400}$ of an inch; $\frac{40}{400}$ of an inch less: from which, and a similar experiment upon a horse, it appears that the distention of the artery does not necessarily depend on the impulse of the blood during the systole of the left ventricle, because all communication with the heart was intercepted. The degree of distention will vary under different circumstances. It was generally increased in a vessel upon tying that of the other side. It is singular that on exposing arteries, a contraction of a small portion, sometimes forming a mere ring, frequently took place, with a corresponding augmentation of the part just before it. Unless the arteries were kept in a tense state by the strong tendency of their muscular and elastic coats to contract upon the blood, this fluid would not be propelled onwards as it is; it would accumulate, instead of moving forwards. The arteries may thus be viewed as sphincters constantly making an effort to contract, and antagonized by distending fluids. The advantage of a combination of muscular and elastic substance is very great. The elastic relieves and strengthens the muscular, and the muscular prevents the elastic from being so stretched as to suffer any loss of its elasticity. It may be well to subjoin a statement of their respective effects observed in some of Dr. Parry's experiments.

"The carotid of a living ram having been detached from all the surrounding parts, its circumference was accurately measured with some fine thread, and found to be $\frac{260}{400}$ of an inch. The animal was then killed by a cord passed round the trachea, without including any other part. The artery being again measured precisely in the same spot, within five minutes after apparent death, was found to be in circumference only $\frac{190}{400}$ of an inch. Thus the circumference appeared to have been reduced $\frac{70}{400}$ of an inch. In order to discover whether any, and how much, of this reduction depended on tonicity, it was presumed that a subsequent period might be found, when the tonic contraction would be entirely lost, and the artery would be brought to that state which was the result of the mechanical power of elasticity. Accordingly, twenty-one hours and a half after the last measurement, putrefaction having already begun about several parts below the diaphragm, the artery was

measured in the same place a third time, and proved to be in circumference $\frac{222}{400}$ of an inch. Hence the whole contraction of the circumference is $\frac{70}{400}$ of an inch, that by tonicity was $\frac{32}{400}$ of an inch, and that by elasticity $\frac{38}{400}$. In another ram, the circumference of the carotid before death was $\frac{379}{400}$ of an inch. The animal being killed by strangulation, as before, the vessel, measured in the same spot, six minutes after the first application of the ligature, was found to be in circumference only $\frac{270}{400}$ of an inch. Being again measured nearly twenty-four hours afterwards, its circumference was $\frac{320}{400}$. Here then the tonicity was as $\frac{50}{400}$ of an inch, and the elasticity as $\frac{59}{400}$."

Arteries thus seem endowed with considerable muscular powers—such as before their life is lost are able completely to overcome the elastic power; and if arteries possess irritability in this degree, that of the capillaries must be great indeed.

We now proceed to enquire into the cause and nature of the pulse. Haller, Dumas, Richerand, Portal Sœmmering, Hales, Hunter, and most moderns, ascribe the pulse, more or less, to the dilatation of the arteries during the systole of the left ventricle, and some of them also to the locomotion of the vessels. Bichat ascribes it entirely to the latter. Jadelot attributes it to the resistance made by the blood to the finger, or whatever else diminishes the canal along which the blood is moving with increased impetuosity when the left ventricle contracts, and this has always been our opinion of its nature. Indeed, every surgeon knows that on exposing an artery, no increase of size is apparent when the pulsation occurs. Dr. Parry has certainly not the merit of originality in the doctrine which he proposes with regard to the nature of the pulse, but he has that of fully establishing it. In a number of observations, the most careful examination did not discover the least change of bulk in arteries during the systole or diastole of the ventricles. The blood in every part of the arterial system, from the initial valves, onwards through the whole frame, to the right auricle, may be considered as a set of continuous columns, possessing little compressibility, and filling the tubes in which they are contained. When, by the contraction of the left ventricle, the blood included in it is forcibly expelled into the *aorta*, all these columns receive the shock of propulsion at

the same moment. But the velocity during this systole, being greater than during the diastole, the *momentum* and consequently the impulse, in every direction, is also greatest in the systole. When, therefore, an artery is compressed with the fingers, in the usual mode of feeling the pulse, the blood, in consequence of the systole rushing into the artery with an increase of *momentum*, gives a stronger impulse of dilatation to the fingers, than from the less *momentum* which exists during the diastole, and thus produces the phenomenon of the pulse. Hence it appears that the pulse is the effect, not of an extension of an artery beyond its usual diameter, but of a stronger effort, during the systole of the ventricle than during its diastole, to restore the usual diameter of the artery, which had been diminished by compression. Since also the excess of velocity from the systole extends throughout the whole of the space compressed by the fingers, it is evident that the distending effort, producing the sense of pulsation, must also be felt throughout that space. Before this explanation could be fully admitted, it was necessary to ascertain the cause of the converse of this state, or the reason why a pulse was sometimes wanting in an artery exposed to the view, and susceptible of any mode of examination by the touch (an occurrence which sometimes took place in Dr. Parry's experiments). Reiterated trials demonstrated, that this deficiency was owing to the following circumstances.—The coats of the carotids are so firm, that when either impelled against any soft substance, or simply moved out of their place, these arteries readily recede, suffering no reduction of diameter, and therefore giving no sensation of a pulse. But if they are confined by any hard substance placed behind them, so as to resist a change of position from the pressure of the finger, or if they are squeezed between the finger and thumb, so as, in either case, to suffer a certain reduction of diameter, then the pulse never fails to exhibit itself. These latter experiments, therefore, while they show that the pulse does not exist under the mere contact of the finger with the artery, and therefore completely refute the supposed dilatation of an artery by the systole of the ventricle, as an object of touch; by ascertaining the precise circumstances under which a pulse does or does not

exist, demonstrate, beyond all reasonable objection, the nature of that phenomenon. Hence we see the probable reason why no pulse is said to have been discovered in some surgical operations. If, however, the principle as to both states be well established, we have only sufficiently to diminish with the finger the diameter of an artery, and then, if it be of a certain size, and the course of the blood through it from the heart be interrupted, we shall not fail to feel the pulse in that artery. It is obvious that pulsation cannot be expected in small vessels, because the stream is in them quite equable, and were it not so, its minuteness would render imperceptible its effort to overcome a resistance.

A longitudinal motion was often remarked in Dr. P.'s experiments, when the left ventricle acted, throwing the vessel into somewhat of a curvilinear direction, and this locomotion is probably sometimes the cause of a visible pulsation, such as is seen in the lower part of the carotids of nervous women, &c.

From the facts ascertained in Dr. Parry's experiments and observations, he finds an explanation of many anomalies in the pulse. Thus in a youth, seventeen years of age, recovering from typhous fever, the pulsations of the left radial artery were like those of the heart, ninety in a minute, while those of the right were a hundred and eighty. The true stroke was sharp and hard, while the secondary was perceptible only when a very slight pressure was made upon the vessel, and ceased when the pressure was increased, or the artery confined. In twenty days this double pulse vanished. The same effect could, the patient said, be produced at any time by violent exercise. It seems probable, that during the systole of the left ventricle, the impulse of the blood produced some locomotion in the artery, perhaps from the laxity of its connexions, and that a secondary pulse was felt when the vessel was recovering its situation.

As the true pulse depends upon the action of the heart, it always corresponds with it. This we all know, yet some have asserted that they have found arteries pulsating without any correspondence with the heart's motion. This, in the case just mentioned, depended upon the artery. Sometimes the arterial pulse is only half as numerous as that of the heart. This may

arise from an affection of the auriculo-ventricular valves, by which a regurgitation occurs into the auricles, and their action is rendered so strong as to be felt externally: or from any circumstance which renders the contraction of the auricles unusually forcible. In several cases no pulsation could be found in the arm, although no change was observable in other arteries or the heart, or in the general health. Some recovered, others died, and dissection discovered nothing peculiar. There probably was a spasmodic constriction of some part of the arterial trunk of the arm, such as was sometimes observed when arteries were laid bare; for in these instances, and where a ligature was made on the artery, so as to diminish its circumference to the same degree, the pulsation beyond the ligature was extremely faint.

The common varieties of the pulse are quick or slow, large or small, hard or soft, and sharp, or irregular in these respects. These are all easily explained by the doctrine of the pulse being the impulse given to the blood from the heart. On quickness and slowness we need say nothing. The magnitude may depend upon the quantity of blood in the sanguiferous system, and upon the dimensions of the vessel itself, without relation to this. Hardness and softness may depend upon the degree of force with which the blood is propelled from the heart; sharpness upon the rapidity with which each contraction of the left ventricle occurs, giving the *pulsus celer*, while the frequency of pulsation in a given time, gives the *pulsus frequens*. Irregularities in these points are easily explicable.

Besides these, many other varieties are mentioned by authors, not easily to be explained nor more easily to be comprehended. We will say a few words upon those to gratify the curiosity of our young readers. The Chinese have the most ancient observations on the pulse. They compared its varieties to many circumstances—one to the pecking of a bird—another to the irregular fall of leaves from a tree—a third to a pole—and a fourth to a man pulling off his girdle, or, who when wishing to wrap up something, has not stuff enough to enclose it—a fifth to the motion of the roots of certain plants which first swim and subsequently go to the bottom (*Duhalde's History of China*). Many of the Chinese distinctions are

similar to those of the Greek writers, and Bordeu, with much probability, supposes both Greeks and Chinese to have been indebted to the Egyptians for their opinions (*Recherches sur le Pouls*). Avicenna and others treated of the pulse musically, and Hoffenreffer in 1641 published a singular scale of the pulse, which was soon followed by similar performances by others, exactly analogous to a musical scale, reducing all pulsations to musical time, and marking by semibreves, minims, and crotchets, semiquavers, and demisemiquavers. Solano described various conditions of the pulse, as predicting a crisis, by purging, vomiting; and many followed up his observations with an infinity of others equally unsatisfactory, such as the nasalis, indicated by *portionis brachialis spatii pulsantis inflatio, cum planitie inusitata, et sensu formicationis quasi granularis parte digitali*, and the gastric indicated by *elevationes spatii pulsantis pyramidales inter indicem et digitum medium, qui sese rapide et irregulariter succedunt*. Those who are curious on these points we refer to Haller, Horstius, Bordeu, Falconer, Bellini, Hoffman, &c.

A further power of arteries, unexpected, we will venture to say, by any of our readers, is contended for by Dr. Parry.

When an artery is obstructed, as in the operation for aneurism, its functions are supposed generally to be supplied altogether by the enlargement of the other branches of the trunk, which are dilated to some number at first, for immediate purposes, and in time collapse, with the exception of two or three, which remain permanently distended.

Dr. P. on the 27th of September was present at the ligature of both carotids in a ram: they came away on the 17th of October, and the animal was killed on the 7th of the following August, and its blood-vessels injected. A plexus of vessels was found running from the part of the artery before the ligature, to the part beyond it, sustaining a communication between the two portions of the vessel which the ligature had separated. Such vessels were never observed in rams under common circumstances; but in two others, in one of which the right carotid was tied, and in the other the left, a similar appearance was found, although probably from one vessel

being sufficient for the purposes of the head, the new vessels were few in number, and not quite pervious.

These facts deserve the enquiry of experimenters, and Dr. Parry has now three other rams, one with a single carotid tied, and two with both, and after a sufficient time has elapsed, the animals will be killed, and the appearance of the vessels made known to the public.

We cannot finish our account of these two very interesting publications, without expressing our satisfaction on finding that two physicians, whose lives have been spent in the active practice of their profession, feel sufficient ardour to prosecute enquiries, from which they cannot expect, at their period of life, any professional advantage. The ardour of young men may be justly often supposed to arise from hopes of professional advancement directly or indirectly accruing; but in other men, it must spring either from a love of truth, or of honourable distinction. The ardour for inquiry diminishes in most medical men with the increase of emolument, because too often felt only for its sake; and we wish that every medical man would, instead of being a mere practitioner, *secundum artem*, or a mere collector of fees, imitate the zeal and spirit of Dr. Parry and Dr. Carson.

Report of Observations made in the British Hospitals in Belgium after the Battle of Waterloo; with some Remarks upon Amputation. By John Thomson, M. D. F. R. S. E. Consulting Physician to the Edinburgh New Town Dispensary; Professor of Surgery to the Royal College of Surgeons; Regius Professor of Military Surgery in the University of Edinburgh; and Surgeon to the Forces. Edinburgh, 1816. 8vo. pp. 281.

[From the Annals of Medicine and Surgery, for December, 1816.]

The high additions to the name of the present author entitle us to expect very much; and we believe no man is better qualified than Dr. Thomson to make a report like the present.

His extensive reading, his correct and cautious judgment, and his patience, candour, and docility, present a combination which few, if any, of his surgical brethren can boast. Though we must all bitterly regret, crowned with glory as we are, the accursed state of nations, drawn out against each other to aggravate intentionally the ills which at all times flesh is heir to; yet we must be pleased that one fitted for the purpose has endeavoured to draw what benefit could be drawn from the field of woe.

The first half of the work contains the REPORT, the second the REMARKS. We shall proceed to give a correct epitome of the former.

State of the wounded. The returns after the battles of the 16th and 18th June were nearly 2000 killed and 8000 wounded. The period was a few weeks earlier than the sickly season of Belgium usually commences. The Professor arrived at Brussels on the 8th of July, and consequently after the first period of inflammation and symptomatic fever had in most instances passed away. What symptomatic fever was still existing put on the bilious remittent or continued type, being evidently affected by the season and climate. This fever began to prove fatal by the seventh day after the battle, and continued to do so till the twenty-first, when the number of deaths suddenly became fewer. On proceeding to Antwerp, the low situation of the place, and the high temperature of the atmosphere, rendered the aspect of sores less healthy than they had been seen at Brussels. They had a tendency to slough, and were, in many cases, passing to a state of hospital gangrene: bilious remittent and intermittent fevers were attacking convalescents, and a bilious symptomatic fever had been severe and fatal. The skin of these bilious patients was deeply yellow, and the absence of black vomiting was the only circumstance which distinguished their case from yellow fever. In general no obstruction or alteration of the liver was observable after death. On returning to Brussels on the 29th of July, violent bilious fever was found to have succeeded some operations, and hospital gangrene was commencing. This disease, though usually infectious, appeared endemial, prevailing proportionately with the endemic diseases of the country. It was accom-

panied by fever and great topical inflammation at Brussels, requiring blood-letting and mild applications, whereas at Antwerp the applications of strong acids, potash, sublimate, arsenic, &c. arrested its progress without exciting inflammation. A few cases of dysentery were found in men who had been removed from low situations, but the disease was not communicated. From the great assiduity of the medical department, upon whom Dr. Thomson bestows great and most just praise, no infectious fever was allowed to occur. Even the hectic fever assumed a bilious form, and was distinguishable from the bilious intermittents and remittents of the country, principally by the absence of the furred state of the tongue, and of the peculiar oppressive sensations about the epigastrium. The zeal and humanity of the inhabitants of Brussels equalled that of the medical department. The day after the battle

"The shops were shut, the people were at their doors, administering cordials, and offering dressing to the wounded, taking the tenderest care of them. The most delicate females and people of all ranks were occupied in this manner. Hundreds of wounded were to be seen in the streets, and some were to be found in every house. Even after the hospitals were fully established, several hundreds of privates, besides the officers, were voluntarily received and taken care of by the inhabitants during their cure. In the course of our visits to the wounded officers, in private quarters, we had frequently occasion to observe the sacrifices which the inhabitants cheerfully made of their accommodations and comforts to their wounded guests, the personal services which they rendered, and the kindness they showed in presenting them with wine, fruit, and other luxuries."

Different kinds of wounds. The incised wounds were seen chiefly in the French prisoners at Antwerp, and were chiefly sabre cuts, and for the most part about the head, neck, and shoulders. Dr. T. censures as bitterly as we did in a former number the unwillingness of the French to attempt union by adhesion.

"I have been surprised to see the practice of stuffing sabre wounds persisted in, till the growth of granulations and the occurrence of cicatrization rendered it impossible to continue

it any longer. If English surgeons err, as I am afraid they sometimes do, by applying too much adhesive plaster to the surfaces of wounds, and by leaving no interstices for the escape of pus and other fluids, the French certainly lose a great deal of time, and often occasion an unnecessary degree of pain, by the indiscriminate use which they make of dry lint."

The punctured wounds had been chiefly inflicted by the lance, few by the bayonet; whence they were larger, more frequently fatal in the first instance, and more disposed to heal quickly and quietly. Tetanus rarely occurred, and when it did, was unusually mild and chronic.

The contused and lacerated wounds had been occasioned by cannon balls, cannister-shot, and pieces of bombs. The Professor takes occasion to express his coincidence in opinion with Vacher respecting injuries occasioned by the wind of a ball. Vacher supposes that in such cases some of the great cavities had been struck by a spent ball, with force sufficient to contuse or even rupture some of the contained organs, without occasioning any external marks of injury. In opposition to the hypothesis entertained by Mr. Ellis, of such accidents arising from electricity generated by the passage of balls through the air, he states that

"He saw, and was informed of, many instances in which cannon-balls had passed quite close to all the parts of the body, and had removed portions of the clothes and accoutrements without producing the slightest injury of any kind. In other instances, portions of the body itself were removed by cannon-balls, without the contiguous parts having been much injured. In one case, the point of the nose was carried off by a cannon-ball, without respiration being at all affected; and in another very remarkable case, the external part of the ear was shot away without even the power of hearing being sensibly impaired."

Some instances were seen of the singular phenomenon of the stop put to the flow of blood through large arteries in contused or lacerated wounds. On amputating the knee of a man whose leg had been shot off by a cannon-ball, the arteries did not bleed, nor did they afterwards require any ligature. Two cases have been seen by Dr. T. where the pulse at the

wrist ceased in consequence of the passage of balls through the fore-arm, near the brachial artery, and two where the pulsations at the temple were stopped by balls passing across the region of the ear.

"In none of these cases was the hemorrhage such as to induce me to believe that the arteries had been divided. The closure in these instances may have been produced either by the rupture of the internal coats from the impulse of the ball, or by the communication of inflammation from the canal of the wound to the arterial tube."

The far greater part of the wounds were from musket-balls, and therefore properly of the kind called gun-shot. In their simplest state they are often very difficult to heal, probably, as Dr. T. justly suggests, because they partake of the nature of both contused and punctured wounds; having, like the former, narrow openings, and being, like contused wounds, attended by slight hemorrhage and pain in the first instance, from the contusion of the parts. The curious course of balls along or around parts is well known, but Dr. T. had reason to believe, from several dissections, that balls may enter cavities and take the concave direction of their inner surfaces, running for some way between their parietes and the contained viscera. Balls are frequently split, and either each piece takes a different direction, or one remains in the spot while the other passes on. The most frequent examples of this kind occurred in the cranium. The investigation of the circumstances which indicate or contra-indicate the dilatation, remote or immediate, of gun-shot wounds, is recommended to military surgeons.

"From the rule, which was certainly too indiscriminate, to dilate in every case of gun-shot wounds, we are probably passing into the other extreme, of dilating but seldom, or not at all. That practice, however, is indispensably necessary in cases in which it is proper to expose to view and tie a bleeding artery; and it may be extremely useful whenever it can lead to the discovery, or faciliate the extracting of foreign bodies of any kind."

Hemorrhage is probably the great cause of death upon the field of battle. Secondary hemorrhage arises from various

causes. If from increased determination of blood forcing open the recently closed mouths of divided vessels, it occurs usually from the first to the fifth day: if from the sloughing of contused vessels (a frequent occurrence in contused wounds), usually from the fifth to the tenth day; if from ulceration, at any period. Secondary hemorrhage sometimes occurs in stumps and the canals of gun-shot wounds, without any vessel being discoverable which afforded the blood. It commonly happens from the twentieth to the thirty-fifth day, though sometimes earlier or later; and is always preceded by heat, pain, and throbbing in the bleeding surface, and is generally in the case of persons of full habit after too great indulgence in food. It strongly resembles the active hemorrhages of mucous membranes, and is to be combated by the same antiphlogistic measures. Those who obtained too great an allowance of wine and animal food, suffered most from hemorrhage among those who were seized with it after the twentieth day, and it consequently seemed produced more by increased determination of blood than by any other cause.

After these general remarks, the injuries of each region come to be considered; and first,

Wounds of the head. Portions of brain were frequently lost without much mischief. In one example, where a portion of the occipital bone and dura mater was removed, the brain protruded, with a slight stupor and loss of memory, but retired together with the unfavourable symptoms, when the inflammatory disposition was subdued. This was the only case in which the removal of a part of the cranium was attended by a disposition to protrusion of the brain.—When paralysis ensued, it invariably attacked the side opposite that which was the seat of the wound.* There was no other relation between the seat of the injury and that of the paralysis.

* Drs. Gall and Spurzheim (*Spurzheim's System of Physiognomy*, p. 31—3,) remark, that all the fasciculi of nerves, both of the cerebrum and cerebellum arise on the same side of the cerebral mass to which they belong, except those of the anterior pyramidal eminences, which decussate each other. They hence explain why compression of the brain affects sometimes the same side of the body, and sometimes the opposite: it will affect the same side if it exist any where but upon the anterior pyramidal eminences, and there it will produce paralysis of the opposite side of the body. The truth of this may be readily ascertained by morbid dissection.

"A wound of the right parietal bone by a musket ball was followed by palsy of the left arm and leg. In another case, a wound penetrating the upper part of the right parietal bone, was accompanied by a slight paralytic affection of the left side of the mouth, and complete palsy of the left leg. In the third case, a sabre wound of the same bone, followed by extensive exfoliations, gave rise to a complete palsy of the left side."

Stupor and paralysis were generally produced by contusion, but were sometimes occasioned by extravasation or depressed bone: sometimes they ceased on the removal of compression, and sometimes continued after all apparent compression was removed; while, on the other hand, great depression of bone was unattended by stupor, paralysis, or loss of memory. The pulse was usually irregular in the cases of compression. The pupils were sometimes dilated when the head was injured; once the right pupil was dilated, and the left unaltered; in another case, one pupil dilated, and the other contracted, and strabismus was a frequent occurrence.—Diffused secondary inflammation of the brain and its membranes was rendered a rare occurrence by the strictness with which the antiphlogistic regimen was enforced.—The absence of fungus in numerous cases of partial loss of cranial bone, and the appearance of similar growths over a contused portion of the brain, where no bone had been lost, makes it undoubtedly probable, that they are occasioned by contusion and not by the loss of resistance. In the cases of fungus, the common symptoms of compression were present.—Convulsions arose in a few instances, where portions of the cranium were driven upon the brain, but ceased in several cases after the removal of the depressed bone, and the strict observance of strong antiphlogistic measures.

Wounds of the Face. Some balls had passed through the frontal sinuses into the cranium; others simply into the sinuses; others from one temple right through the orbits, not affecting the cavity of the cranium, or not affecting the eyes, or passing through the eye-balls, or dividing the optic nerves; loss of sight without any appearance of injury in one or both eyes, or the occurrence of violent inflammation, or the former state in one eye and the latter in the other, was a frequent

consequence of the passage of balls only near the eyes. The bones of the external meatus auditorius and the mastoid processes, were frequently fractured without injury of the brain. Some bullets that had entered the mouth were immediately spit out; others lodged in different parts, and others passed on, sometimes piercing the tongue or carrying a greater or smaller portion of it away. In the latter cases the speech was not much impaired.*

Wounds of the Neck. The hair-breadth escapes in cases of this kind were really extraordinary. No wounds of the carotid artery or internal jugular vein were seen, and probably because such proved fatal immediately. No unequivocal case of a wound of the œsophagus was observed. Wounds of the larynx were often attended by hoarseness, cough, exfoliation of cartilage, and all the sympoms of consumption.—Where some of the cervical nerves were wounded, more or less paralysis of the extremity sooner or later was induced, attended with much pain or with severe pain in the part injured.

Wounds of the Chest. The hemorrhage from the external wounds was readily suppressed by compresses and bandages, and no ill effects ensued, as might have been supposed, from internal accumulation of blood. In no instance was discolora-

* The tongue is so commonly regarded as the grand organ of speech, that to lose one's tongue, and to have a long tongue, &c. are proverbial phrases. Yet testimony analogous to Dr. Thomson's is on record. A girl born without a tongue is mentioned in the *Mémoires de l'Acad. des Sciences de Paris*, 1718, p. 6, who talked as distinctly and easily as if she had enjoyed the full benefit of that organ, and the physician who wrote this account refers to an instance published eighty years before, of a boy who retained the faculty of speaking after losing his tongue by ulceration in the small-pox. Similar instances are related by Louis, Richter, Huxham, Bartholin, Tulpius, &c. Dr. Berriman, in his Historical Account of the Trinitarian Controversy, relates, among the wonders of the early Christian church, that an orthodox party in Africa had their tongues cut out by Prince Hunneric the Vandal, of the Arian party, and that all, excepting two, most *miraculously* were all able to talk afterwards as well as before. Yet whether doubting (as he well might) of its being really a miracle, or wishing, like many other short sighted and very questionable Christians, to exalt Christianity by *pious* lies, he adds, (*ô hominis impudentia!*) what those who set the least store upon their tongues will not believe; that "of these poor sufferers one who had been dumb from his birth, yet by losing his tongue with the rest, acquired also the use of speech."

tion of the loins observed from infiltration of blood, a symptom, said by Valentin to be characteristic of extravasation into the cavity of the pleura, and confirmed by M. Larrey. In three cases where balls had lodged in the cavity of the chest, the patients appeared hastening to convalescence. Inflammation and hemorrhage were vigorously opposed in all these wounds by venesection. One patient was bled to the amount of 250 oz. in eighteen days. In two cases a ball passed through the chest and lodged under the scapula, and in ten had passed out through the scapula. In three the reverse happened: the ball entered through the scapula and passed out through the front of the thorax. In two, it had passed through the chest from side to side. Emphysema rarely occurred; in one instance, the puffy tumour which it formed was cut into, and air and bloody serum discharged with great relief. In cases of suppuration, the wounds were in some cases open, in others, closed. When the opening is high and narrow, the Professor thinks advantage may be often gained by a counter opening lower down, and suggests as a prize question, "What the cases of wounds are, in which tents and tubes may be useful, or in which they are likely to prove injurious?" When the wounds had healed during the pleuritic inflammation, pus was often secreted, occasioning rigors, dyspnœa, especially on the opposite side, flushed cheeks, purple lips, and enlargement and dull sound on being struck, of the affected side. An opening for the escape of the matter gave great relief, and one poor Frenchman, who obstinately resisted the operation, died of empyema, in great agony. Wounds of the diaphragm were frequently recovered from, and were unattended by risus sardonicus, or convulsive motions of the chest.

Wounds of the Abdomen. Twelve cases of wounds of the liver were seen. Bile was discharged through the parietes of the abdomen in some, through the lungs in others. No effusion of bile into the abdominal cavity was ever observed. In one case, some bile was found, in a kind of abscess, between a wounded part of the liver and the diaphragm, but was prevented by adhesions all around from flowing into the cavity of the peritoneum. Jaundice was not observed in cases of wounded liver, except in two cases when it was suspected to

be of the same nature as the yellowness which attended the symptomatic fever of wounds in many other parts. Two cases only of wounds of the stomach were seen, from which the patients were recovering. In twelve cases of wounds of the intestines, from which recovery was taking place, no protrusion of the bowels occurred, As usual, patients seldom survived wounds of the *small* intestines. Those of the large often heal without difficulty. It is now established, that intestinal openings, whether by external injury or sphacelation, are best left to themselves, bleeding and the antiphlogistic regimen being vigorously practised.

"In a very singular case, in which a musket ball had entered the abdomen, a little way below, and to the left side of the umbilicus, and had come out on the same side, near to the spinous process of one of the lumbar vertebræ, a small quantity of fæces continued, during our stay in Belgium, to be discharged by the posterior wound, through the whole depth of the muscles of the loins. This man was sensible of voiding quantities of air along with his urine; and in the progress of his case, not only small quantities of air, but also of his urine, were distinctly observed to be mixed with the fæces which escaped from the wound. In this case, it seems probable, that an opening existed in the ureter of the side on which the wound had been inflicted. In another wound in the back, in the region of the kidney, urine was discharged by the orifice of the wound, for twenty-five days. During this time, the quantity of urine voided by the urethra was considerably diminished, and the patient had suffered, and continued to complain of great pain in the course of the spermatic cord."

No fewer than fourteen cases, in which the bladder had been penetrated by a musket ball, were seen in progress towards cure. In two instances the wound of the bladder was complicated with one in the intestines. The urine was discharged generally from both orifices, though sometimes only from one. The use of a flexible catheter, to make the urine readily escape by the natural passage, was highly beneficial. The urine was never known to escape into the abdominal cavity. In several instances balls had passed through the pelvis, without injuring either the bladder or intestines.

Wounds of the Loins and Pelvis.—These were wounded in every possible direction; and it was extraordinary, how the blood-vessels and nerves gave, in numerous instances, no signs of injury. Paralysis frequently accompanied gun-shot wounds, where the ball had passed across the loins, and through the region of the pelvis. It was complete or partial; and usually, but not always, took place at the moment of the wound. Severe pain often affected the seat of the injury; sometimes the thigh, or the knee, leg, and foot. Both extremities were seldom affected.

Wounds of the inferior extremities. Balls whose direction was towards the hip joint, generally lodged, probably from the depth of the solid parts which opposed their progress. Synovia was, in many instances, discharged from the hip joint for some time. Large portions of the thighs and buttocks were seen, carried off by cannon-balls, and the wounded surface looked, at first, gangrenous, and afterwards smooth, like glass, in spite of the utmost attention. The muscles of the thigh often protruded; the thighs were seen penetrated by musket-balls in all directions, and these wounds healed, for the most part, readily. Secondary hemorrhage, from the sloughing of the femoral vessels, was a frequent occurrence. In one case, the hemorrhage had come from the femoral artery, so near the groin, that it became necessary to cut down upon, and tie the external iliac artery. The femoral vessels, like all others, had numerous wonderful escapes, and, in two instances, were exposed by foreign bodies without bleeding. Many wounds of the thigh were complicated with fracture. Dr. T. very properly recommends the extended position of the limb, in fractures of the thigh, according to the French mode.

"It is only by placing the limb in the extended position, that it is possible to judge of the degree of shortening and distortion, which have taken place in the limb; and it is in this position only, that we can propose to remedy these, by making, from time to time, such extension of the limb as the soft parts may admit, and to counteract, by position, splints and bandages, that tendency to displacement of the fractured bone, and distension of the limb, which are produced partly by the action of the muscles, and partly by the weight of the inferior part of

the extremity. We saw excellent effects produced in numerous instances, by the application of rollers to the foot and leg, while the soft parts, more immediately surrounding the fracture, were more gently compressed by the eighteen-tailed bandage, or by the bandage of Scultetus, applied so as to admit of, and to facilitate the discharge of the matter from the abscesses and sinuses which had formed in the neighbourhood of the fractures."

He bestows a similar praise upon the French, to what we ourselves did in a former number; like us, often recommending our treatment of wounds by adhesion to them, he holds them up as an example to us in the treatment of fractures.

"Nothing can be more laudable, or better deserving of the imitation of English surgeons, than the great pains which the French surgeons, in general, bestow upon the management of fractured limbs. If, in the earlier stages of their injuries, they sometimes err, by trusting too much to mechanical means, it would be unjust not to acknowledge, that they excel us in the after treatment, by the very great attention which is given daily, at each dressing, to the condition, position, and bandaging of the limb."

The local and constitutional effects of a large proportion of diseases of the knee joint, were extremely severe and fatal. When balls had passed through the knee joint, and fractured the ends of the bones, the synovial membrane and cartilages were found, upon dissection, in a state very analogous to that of scrofula. During recovery from wounds of this joint, it became swollen and stiff, having very much the appearance of white swelling, and was greatly, and often suddenly, relieved by a large number of leeches; violent erythematic inflammation, was not an unusual attendant upon fractures of the inferior extremities. Injuries of the ankle joint were almost as severe as those of the knee. The swelling was proportionately greater, but the constitutional symptoms were less severe.

Wounds of the superior Extremities.—Of these, there was of course, every variety, with numerous strange escapes of nerves and blood-vessels.

The second half of this work is upon amputation, and is

written with all the learning, judgment, and candour, which characterize the Professor.

The history of the opinions of surgeons, respecting the cases in which amputation is necessary, and, when necessary, the period at which it should be performed, is given in a very faithful and elaborate manner, from the days of Celsus, to the publication of Mr. Guthrie's able work of Gun-shot Wounds of the Extremities requiring the different operations of amputation. From this it is evident,

"That the cases of injury which require amputation, and the period in which it may most advantageously be performed, are points which have been the subjects of much discussion among medical men, and that great progress has been made already in their investigation. It appears, also, that all military surgeons have allowed, that there are certain injuries of the extremities, in which amputation is required: that most of them have been of opinion, that in these injuries it is more advantageous to operate immediately, or soon after they have been received, than to delay the operation; and that those who have contended for delay, have, in general, agreed, in regarding it as extremely dangerous to operate during the existence of high degrees of inflammation and fever."

The Professor strongly urges the propriety of immediate amputation in many cases of injuries of the extremities. For our part, we cannot conceive, why any surgeon should think of not amputating immediately, if the injury is of such a nature, that the operation will evidently be necessary, or that the chance that it will be necessary is as great as that it will not. In these circumstances, the operation is intended to save the patient the agony of the wound, and to save the constitution from the ill effects of it. The operation will, moreover, be borne better at first, and whatever injurious tendency full health may have upon it, the system may be lowered with much more humanity and benefit by venesection, or by allowing plenty of blood to escape during the operation, than by a train of agonizing, inflammatory, and suppurative processes. No objection, we are certain, would have ever been made against immediate amputation, if the cases, in which it has proved unsuccessful, were, with judgment and candour, com-

pared with the successful instances of amputation at a distant period.

"The greater part of the objections which have been stated to immediate amputation, appears to have been founded on the unsuccessful results of operations, performed upon the second, third, fourth, and even fifth day of an injury, at a period when inflammation and fever must necessarily have commenced. It is this inaccuracy of observation, also, which seems to have given rise to the opinion so often maintained, that a state of health and vigour is a state unfavourable to amputation; an opinion which has been amply refuted by the late experience of army surgeons, and the truth of which, indeed, had been previously disproved by the very great success, which, in most situations, has been known to attend the long-established practice of immediate amputation in the British navy."

After the battle of Waterloo, the cases of amputation amounted to nearly 500, and, in more than one-third, the operation had been performed before the supervention of inflammation and fever.

"The number of those, in whom amputation was delayed, who died before it could be performed; the protracted pain, suffering, and danger of those, in whom that operation became ultimately necessary and practicable, and the far greater proportion, even of those who died, than of those who had undergone amputation at an early period, were circumstances so evident and striking, as to occasion many regrets among the army surgeons, that primary amputation had not been more frequently performed."

The work closes with an account of such wounds, as from their degree and situation, require immediate amputation.

All the fault we can find is, that the report is not sufficiently minute, and this, no less than the omission of the discussion of several points in amputation, the author himself regrets. If the work is like the rest of the Professor's writings, not remarkable for originality, yet it displays great reading, and careful observation and reflection.

ORIGINAL PAPER.

On the Puerperal Fever of Northumberland.

BY JAMES JACKSON, M. D.

Northumberland, March 29, 1817.

DEAR SIR,

THE puerperal fever has lately appeared in this neighbourhood with great mortality: the mode of treatment, which I have partly taken from books, has proved very unsuccessful, and therefore I cannot but cast an anxious look to my preceptor in the obstetric art. During the winter there were so many lectures to be attended that we seemed to be plunged into an ocean of learning and science, in which we might say with the poet,

——— unda impellitur undâ
Urgeturque prior venienti urgetque priorem;

and this I hope will prove some apology for the deficiency of my notes on the present subject.

The sixth of November, a woman was delivered under my care, who was attacked with it but recovered. Six others whom I attended, during the subsequent four weeks, escaped it, and had a good getting up, except one, who had a pneumonic inflammation, that required four bleedings to subdue it. On the 23d of December, another of my lying-in patients, took the disease and died; and every woman that I have attended since that time has taken it, and all except one fallen victims to its fury.

You can judge then of the state of my mind, and I hope pardon the liberty I have taken of writing to you and requesting some advice in the treatment of this untoward disease. There are many women in this neighbourhood, who are far advanced in their pregnancy, and therefore I cannot but be particularly desirous of ascertaining the best mode not only of curing, but also of preventing the complaint. To answer

this last indication, I had almost determined upon the use of bark as recommended by some authors; and yet the onset of the disease has been so highly inflammatory, as to render it with me, a subject of more serious consideration.

The disease has, for the most part, answered the description of it in books, and therefore I shall only make a few observations, for I should be very unwilling to trouble you with a long and tedious narration.

The first case was cured by bleeding, purging, and fomenting the abdomen with flannels rung out of hot water. Injections were not admissible for particular reasons. The pulse was full and strong, but not tense, blood inflammatory, headach and abdominal pain severe, stools black and offensive, the milk and lochia suppressed for five days. The disease gradually subsided without running into the typhoid state.

In this part of the country, I am very frequently called to visit women in the puerperal state, with inflammatory fever, apparently induced by the hot regimen of the midwives and nurses, and therefore I was the less alarmed in the present case, though I observed at the time many symptoms very different from any I had before met with in this vicinity.

In the second case the patient was delirious at the first attack, the abdominal pain and headach soon became very severe; pulse large, bounding 130 in the minute, and somewhat tense. In this case the blood was not inflammatory at the first bleeding, which was seven hours after the attack; but considerably so at the second, which was four hours later. On the second day, about the 17th hour of the disease, I was about to bleed her a third time, but believing that I discovered something of a typhoid action lurking under fulness and apparent strength, I determined to wait the event of a few hours.

In the afternoon, the porraceous vomiting came on, which reduced her at once to a typhus state. Stimulants were then given, beginning with opium, Huxham's tinct. and the aromat. sp. of amm. Towards the last vibices appeared over the whole body; she lived sixty-six hours from the attack, and died without any symptom of suppuration or gangrene. The body went rapidly into putrefaction.

In the third case, the woman appeared pretty well for five

days, the milk was secreted copiously, and the lochia were in proper quantity. About this time, I observed a sharpness of the voice, which gave me some uneasiness; soon after she complained of ringing in her head, and there were now some slight symptoms of fever. On the eighth day she had a severe chill followed by fever, pain in the abdomen and suppression of the milk. She had been for some time in a bad state of health, troubled in mind, and strongly prepossessed not only with the belief, that it was her fate to die in this confinement, but also with a strange desire of not surviving it.

She was neither bled nor blistered. The bowels were kept open, the abdomen fomented, and tonics administered almost from the very first. Her disease at once assumed the symptoms of the typhus gravior; vibices appeared over the whole body, and she died a mere mass of putrefaction on the sixth day.

The child sickened of a fever and died in a few days, with abscesses in various parts of its body. It did not suck after the first signs of disease in the mother.

Case fourth, was that of a woman who was delivered under my care, of her first child, the very day before the preceding patient was taken ill. Her labour was natural but severe, and lasted about sixteen hours. After she was put to bed, I observed that the pulse was fuller and more frequent than natural; but as I had bled her about twelve hours before for a thickened state of the os uteri, it was not thought proper to repeat the operation, and more particularly as the lochia were pretty copious. The weather was excessively cold, and she was therefore indulged with curtains and a good fire, but with nothing else that was heating or inflammatory.

About eight hours after delivery, she was taken with a chill, followed by fever and pain. Next morning I found her labouring under the puerperal fever, with excessive pain in the head and abdomen; the pulse was full, strong, and 120 in the minute. By moderate bleeding, purging, injections without number, and fomentations, this woman happily recovered, the disease going off about the seventh day, without assuming the typhoid character. This lady's agony was truly terrible to bear, and distressing to witness. For the first thirty-six hours I

frequently heard her moaning, when I was approaching the house. This was the only patient in the whole number, that was favoured with judicious nursing.

The child appeared to be healthy, and took milk and water, till about twenty hours after delivery, when, without any evident cause, it became purple and died, before it was a full day old.

About this time, I was called to a woman in Sunbury, in the seventh month of her first pregnancy, who was threatened with an abortion. Her pains were very slight, and the os uteri not at all dilated. She was bled freely and took opium, which quieted her pains, and I left her with the hope that she would pass a comfortable night. I was called to her towards morning, but before I arrived, she had been delivered of a dead putrid child. This woman continued well, for thirty-six hours, when she was taken with a chill which was followed by a fever and a copious flow of milk. This had well nigh deceived me; but a slight pain and swelling of the epigastric region, ringing in the head, with partial deafness, were pathognomonic of something more than the milk fever.

The pulse was small, frequent and somewhat tense. I need not mention the treatment, as nothing that I recommended was fairly tried. The neighbouring women crowded in, some were sober and others drunk, and every one did what seemed right to her own understanding. The woman soon sunk into typhus, and died on the sixth day.

The next case happened also in Sunbury, at the very time I was attending the preceding woman. Here I pursued the same plan of treatment, that has been already described, but the second day my patient sunk into typhus, and died on the sixth. It was found necessary to bury her in ten hours. The child did not suck, and was removed from the house, as soon as the mother was taken ill. It, however, sickened and died in a few days, with abscesses in various parts of its body.

The seventh and last woman was delivered by a midwife at my request, as I was lame in one hand and unable to attend; but the secundines not being expelled in due time, I was called upon to render assistance. This was afforded, by the introduction of the fore finger, for the placenta was lodged

in the vagina, and upon being raised at one side, was expelled by the pains.

This woman was seized on the evening of the second day, and during the night was immoderately heated with bricks, and tea of pennyroyal, or the mentha pulegioides. Next morning I was called; I found her labouring under the fatal epidemic. The pain of her head and abdomen had been excruciating all night, the epigastric region was swelled, pulse 130, pretty full and strong. Twelve ounces of inflammatory blood were taken, salts and injections administered freely, and fomentations applied to the abdomen. She was soon relieved of most of her pain. No more blood was taken, but the other means were continued for two days, when there was hardly a symptom of the disease left. The skin was cool, tongue becoming moist and clean, pulse 92, headach gone, there was no pain in the abdomen, even when she coughed severely, and she had slept comfortably most of the preceding night.

Her excellent nurse now left her under the care of the family. Every thing was done wrong; when I prescribed injections, they gave her dose upon dose of salts; they damped and chilled her with fomentations carelessly applied; and the disease was soon changed into a violent inflammation, the character of which I did not detect, until it was too late to afford relief, considering it merely a relapse into her former complaint.

I had now no hopes, but from a moderate suppuration. In this too I was disappointed, for the inflammation proceeded with great rapidity, and in two days had involved the whole abdomen and thorax. She had been tending towards a consumption for some time, and had then a severe cough which aggravated all her symptoms. She died of pure inflammation on the eighth day.

In the preceding account, there was much omitted for the sake of brevity, which may now be brought into a collective view.

Porraceous vomiting was a very common symptom, but the two women that recovered, escaped it altogether, they threw up only the common contents of the stomach. In the typhus stage, opium, Hux. tinct. and the aromatic sp. of ammon.

were found useful in checking the vomiting, which was now sometimes completely black. Porter was not within our reach, and the effervescing draught was not tried, as there were no nurses of skill to administer it. The fomentations were always agreeable when properly applied, and succeeded in three cases to my entire satisfaction, but in all the rest I have reason to believe they were hurtful from the careless or ignorant manner in which they were applied.

Why they should be useful, I cannot determine; but certain it is, that they always afforded comfort, except in the last stage.

The blisters I am afraid afforded no relief, and perhaps were rather an additional irritation, their effects being altogether inadequate to the violence of the disease. Neither emetics nor nauseating medicines were tried, for I could not persuade myself, that artificial vomiting could be useful, where the spontaneous proved so painful and destructive. Even that which came on at the very first attack, proved very terrible to the poor patient, who would frequently cry out in anguish, "Oh if it were not for this vomiting."

Injections always gave present relief, frequently bringing away large fœtid black stools, and a prodigious quantity of wind. In some cases the womb was washed out with large injections of warm water, which sometimes brought away clots of blood, and always afforded some present comfort.

The milk after the second day was always absent; the lochia continued more or less in every case, except the first, during the whole course of the disease.

During all this time, the midwives in the neighbourhood attended four, and a physician in Sunbury one woman, all of whom escaped the disease, though none of them had what we call a good getting up. I began to think that it occurred only in my own practice, till a few days ago, when the physician of Pennsborough, twenty-seven miles up the river, informed me that one of his patients had taken the disease and died in two days, and that a woman of Milton, who was delivered by the medical gentleman of that place, took it and survived the chill only twenty-four hours. In both cases, typhus supervened very early.

In one case only was the labour severe, in all it was natural, and the placenta came away entire with the uterine pains, without any assistance on my part, except in the last case, when, as I mentioned before, only the finger was introduced.

Three of the women that died, were of an unsound state of body, and in every case except two the nursing was the worse that could be described; so that probably the disease in more skilful hands, and under more favourable circumstances, would be attended with less mortality.

The prevailing brumal fever of this place, has been for several years the synochus of Dr. Cullen, the first stage of which, has been highly inflammatory, and very commonly attended with enteritis or pneumony. Some cases have occurred early in the winter; but it is most common from the middle of February to the middle of April. In good constitutions this fever may very often be cured, by moderate bleeding, and other suitable remedies, without running fairly into typhus, coming to a laudable crisis sometimes as early as the fifth day. But either too much bleeding, or a too early use of stimulants, will certainly protract it into typhus. I have known some ignorant practitioners mistake the disease for a pleurisy, and reduce their patients in a few days, below the reach of medicine.

This fever, which in Northumberland is commonly called typhus, generally falls upon the lungs of the intemperate, and is then almost certainly fatal.

About thirteen months ago, I was called to a woman in the seventh month of her pregnancy, who was labouring under this disease, with pneumonic inflammation. The typhus stage appeared to be at hand, and she was therefore not bled. She had had a severe cough for several months, which was now redoubled in severity, and her difficulty of respiration was very great. On the fourth day of the disease she miscarried, and as the discharge was greater than she could bear with safety, a smooth piece of ice was introduced into the womb, which brought on a contraction that expelled both my hand and the placenta. The cough and pain were so distressing that she slept none for seven times twenty-four hours, yet the fever came to a regular crisis on the seventeenth day. Here no complaint of the abdominal viscera followed. Three weeks

afterwards, she was taken with an inflammation of the lungs, which required twenty bleedings and a salivation to subdue it. She now enjoys better health than she had done for many years. This case may help to show that it is not the fever of the season falling upon the debilitated abdominal viscera.

There is, however, another argument that may prove more convincing. Four years ago last winter, the synochus was epidemic in this part of the country, and carried off many of the inhabitants. I was living in Philadelphia at the time, but upon inquiry, I do not find that a single woman in child-bed took the disease.

As to the contagiousness of our puerperal fever, I must acknowledge myself in a state of suspense. Never was there a more determined enemy to the doctrine of contagion than myself; yet, in this fever, I resolved from the first, to act on the side of safety.

The last patient had not been exposed to the infection, nor had the midwife or any of the women about her; and I did not go to her, till I had bathed and put on a new suit of clothes, procured for the purpose. Even then I was not five minutes in the room. This case, it is true, ended in pure inflammation, but it is equally true, that it was puerperal fever for the first forty-eight hours, and that the inflammation was super-induced by her imprudent nurses.

As the fever began with the cold weather, I have some hope that it will also cease with it. The last case was certainly the mildest and most manageable. We have heard a confusion of reports, of its being in various parts of the country, but I believe that none of them are to be trusted.

After reading the above, you will not be surprised if I freely acknowledge myself in a state of extreme anxiety. I am not solicitous for my reputation, for I sincerely believe it to be yet secure, as I have now practised four years in this place with complete success in every obstetric case; the woman being able in every instance, except those above detailed, to leave her chamber in three weeks. Even when the midwives had inflamed their patients with the hot regimen, they always found safety in my lancet.

I have no books upon the subject, but your edition of Burns,

Leake, Denman, and White of Manchester, and with these the little that is to be found in practical authors. If you will be so kind as to write a list of such as are useful and can be procured in the city, I will request the bookseller to call upon you for it. I would prefer them in English, but if there are any good treatises in Latin, French or Italian, which I do not expect, I would be glad to have them.

If you think that a more exact account of the disease with the mode of treatment, drawn up with a greater degree of care, would prove any acquisition to the Eclectic Repertory, I will undertake an essay on the subject, after the disease is supposed to have passed over. And I would be the more willing to publish an account of these cases, as a neighbouring physician has made some attempts to prove, that there is no such disease as this I have been describing, and that all these misfortunes were owing to an erroneous practice. Such a man may truly exclaim with Lucretius,

> Suave, mari magno turbantibus aequora ventis,
> E terra magnum alterius spectare laborem,

and yet this very man lost a patient a few days ago in this disease, in twenty-four hours after the chill.

I am your affectionate pupil,
and obedient humble servant,
SAMUEL JACKSON.

DR. THOMAS C. JAMES.

BIOGRAPHICAL SKETCH

OF

EUSEBIO VALLI.

[Translated from the Spanish, and communicated by the Editor of the Port Folio.]

When society is deprived of a valuable member, who has achieved what his genius prompted him to attempt, or who leaves his labours in such a state, that they can be arranged so as to conduce to the beneficial purposes that were contemplated by the author, his tomb may be honoured by tears of admiration and gratitude. But when the benevolent man is arrested in the very moment that humanity is about to be relieved from her sufferings through his skill,—when he falls a victim to the very calamity which he was about to obliterate from the dark catalogue of human woes, we know not where to seek consolation. Throwing aside the balm which resignation infuses into the afflicted mind, we lament the loss of a life so necessary to man! Such are the feelings which are excited by the recent and sudden death of Dr. Eusebio Valli. His fearless philanthropy had led him to a personal inspection of the pestilence in Asia, and he had but lately arrived among us to apply the result of his experience on the disease of our hemisphere.

Ponsaco was not, as Pacdioni thought, the place of his birth; at least, we are assured, by a native of that place, that his name is not to be found in their public registers of baptism of that city. He was probably born in *Mon-feltro*, a small town on the confines of Romania, where his father resided about the year 1778 and practised the art of surgery. We have no account of his literary education, nor of the place where he was initiated in the elements of knowledge. The diploma of a physician, which he received from the College of Pisa, his general acquaintance with the languages, ancient and modern, the marks of distinction which were conferred upon him by learned in-

stitutions, are sufficient testimonials of his acquirements in those branches of knowledge, which treat of the diseases of man and the natural sciences. Iadelot, in a discourse prefixed to the French translation of the Galvanic experiments of Baron Humboldt, asserts that the physician of Pisa discovered animal electricity long before the naturalist of Berlin. About the year 1793, he wrote, in the English language, a treatise on this, until then, unknown phenomenon; and in his own language he subsequently published several essays on the same subject. These were afterwards reprinted by *Brugnatelli*, in the Annals of Chemistry and Natural History, at Pavia. They received further honour by being translated into French and inserted in the Journal of Medicine, Chemistry, and Natural History of Paris. In these writings he proves, from repeated experiments on frogs, that the Galvanic stimulants recommended by Galvani, Volta, and Aldini, are not necessary to excite animal electricity; by touching a muscle or its respective nerve, a motion is excited which may sometimes be perceived 30 minutes after the death of this animal: a result which contributed, perhaps, to the ingenious system of organic life, which has been illustrated, in so admirable a manner, by Dumas, Richerand and other physiologists. From his letter to *Astier* on the anti-putrid and anti-fermentable properties of the red oxyde of mercury and the answer of this professor, it appears that Valli discovered this property in mercury and the latter found it in camphor. If the eulogium which this received from the first Institute in France should not be sufficient to show the knowledge of Valli, we have further evidence in another work, in which he shows himself versed in the doctrine of diseases, physiology and anatomy.

Perfectly master of the auxiliary sciences, Valli confined himself to the disciples of Esculapius and endeavoured to discover the hidden mysteries of his sublime science. Like him he despised mere reptiles and resolved to purge the earth of the monsters by which it was desolated. In pursuit of this laudable design, he travelled through Europe, Asia, and America, exposing himself voluntarily to the most dangerous diseases.

If we except his essays on chronic diseases, all his investiga-

tions were confined to the examination of the acrimony of epidemics in general, hereditary phthisis, the plague and the yellow fever. In the first part of his treatise on phthisis, he establishes various propositions, which if they were not fortified by his great erudition, might be regarded as paradoxical.

Until the year 1794, Europe had been the theatre of his philanthropic exertions; but, as he has himself said, no obstacles can intimidate a mind which is ambitious of an honourable fame, and a heart that cherishes the best feelings of human nature. He went to Smyrna, and waited with impatience for the arrival of the pestilence, which was about to spread dismay among this unhappy people. He watched its progress without being intimidated, and wrote a treatise on the subject, of which it may be no mean praise to state that it was approved by Tissot. Having learned afterwards from *Ingrasias y de Orreo* that when the variolous disease prevailed, the plague ceased; and that as soon as the latter disappeared the former revived; he supposed that the variolous contagion extinguished, or at least, neutralized the plague: from which he inferred that the *virus* would be a preservative against the plague, or that it might soften its malignity. This idea occurred to him in 1785, when he was in Scio* where the plague frequently prevails. Not finding any case of that disease, at the time, he could not make the necessary experiments; but he recommended the subject to the Faculty in that Island and also to those of Smyrna; and gave a variety of rules by which the results of experiments might be obtained with accuracy.

In 1800 Italy was in the possession of the French, and Valli was employed in the army. With the permission of the government, he went to Constantinople where the plague then prevailed. In the month of June he made his first trial on himself. He mixed some variolous matter with the contents of the stomach of a diseased person and inoculated himself with it. For the space of six days he felt the various symptoms of that disease, and his own account of his case, is more interesting to mankind in the opinion of Kalogera than the history of six centuries. He thought he was now safe from this disorder,

* Chios, Island in the Archipelago. What say the Greeks?

but he was again attacked on the thirteenth August with such dreadful and malignant symptoms, that he was astonished when he found himself recovering from it. He was ill 23 days, and after that was so tormented with carbuncles and buboes, that he lost part of the heel of his left foot. When he recovered he continued his experiments; sometimes mixing the *pus* of the plague with the *variolous matter*, sometimes with the gastric juices of animals, sometimes with oil, and he finally vaccinated some persons, being persuaded that he had accomplished what he so ardently wished. The pestilence having ceased at Constantinople, he went to Natolia, where he found the sheep perishing under the ravages of disease. He conceived that this disorder might bear the same analogy to the plague, that the vaccine does to the small pox. But he did not succeed so well in this disease as he expected; for the disease not being contagious, he could not communicate it by inoculation. From Asia he returned to Constantinople and thence passed over into Italy. In 1805 we find him professor of Chemistry and first physician in the Civil Hospital of Mantua, superintending the publication of his histories of the plague, and the various diseases of cattle. The former was dedicated to Prince Ipsilanti and the latter to the reigning Prince of Moldavia; each of whom was worthy to be the Mæcenas of Dr. Valli. The history of the plague is frequently quoted by Bonnisset in his account of the manner of communicating the contagion of the pestilence to men and brutes.

We are not certain how long Valli remained at Mantua; but we learn from a dispatch, without date, from Ragusa to the Minister of the War Department, that having made observations on the yellow fever in that province, he begged to be employed in the army of Dalmatia, in which province a contagious pestilence had appeared among the flocks. It yet remained for this intrepid experimentalist to encounter, near the torrid zone, another monster, as fierce and inexorable as the plague. He was not intimidated either by the immense distance or its inaccessible situation. Having consulted the various works of all who had written on the subject of yellow fever, and compared their observations with his own experience, in Italy and Spain, he determined to go to the *United States*, where this

disease prevails almost every summer,* in order to subject his different hypotheses to new tests, and, if possible, to condense them into an uniform theory.

On the fifteenth of December of the ensuing year the Duke of Feltre, Minister of War, granted him permission of absence for this purpose, and allowed him to retain his rank and pay as a physician of the Military Hospital of Dijon.

When he arrived in Philadelphia, Dr. Moore expostulated with him on the danger to which he was about to expose himself; he answered that he was aware of the hazard, but he was resolved to inoculate himself with the vomit of the dying or the bile of the dead, taking care, however, to mix with it the reactives which he had used on former occasions. If his experiments should cost him his life, he consoled himself in the reward which fame would bestow upon his memory. By a rare fortune this city was preserved from the usual visit of this disease, at the period we mention. He then went to New York and thence embarked for Havanna, where the yellow fever almost always proves fatal to strangers. He arrived on the eighth of September last, and was recommended to his excellency the Captain General and the Intendant of this Island by the Minister from our Court to the United States. The ambassador represented that he was a learned man, who proposed to be useful to mankind at the expense of great personal difficulties; and that after having travelled with that view in Spain, France, England, and Germany, he went to Constantinople and inoculated himself with the plague in order to observe, on himself, its symptoms and effects: that, desirous of becoming acquainted with the yellow fever in the same manner, he had come from Europe to the United States; not finding the disease he proposed to seek it in this island. His excellency added that he merited every assistance which might enable him to perform a service so important to humanity.

On his arrival, he presented himself to the Tribunal of the

* This expression requires to be qualified. Though we lament the ravages committed by the yellow fever in different seasons, this city has now experienced an exemption from that scourge for the last twelve years.—EDITORS.

Proto Medicato, explained the object of his visit and begged that two of the faculty might be permitted to accompany him, and witness his experiments. He flattered himself, he said, that he could communicate to them observations on the disease of the island, which might be of use. Dr. Antonio Machado and myself were honoured with this appointment. On the twentieth of the same month, Dr. Valli went to the hospital of St. Juan de Dios, accompanied by Dr. Antonio Mendoza, in search of a case upon which he might commence his experiments. He found but one, and in that, the patient was so ill that he was thought to be breathing his last. Valli observed him with surprise; black, corrupted blood was issuing from his mouth, and other parts of his body exhibited the cadaverous appearance of death. He felt his pulse. A profuse, cold perspiration congealed his hand. The intrepid physician who had braved death so often, was appalled! He retired in order to bathe himself with vinegar. The dread was but momentary. Benevolence to mankind prevailed over fear, he returned to the hospital on the ensuing day—sought the patient—and found him in his coffin! Pliny the naturalist was devoured by the fire of Vesuvius whilst he was exploring its causes:—Lippi, the botanist, was assassinated by the barbarians of Abyssinia:—Bichat, the anatomist, imbibed the germ of a disease which brought him to a premature grave, in the amphitheatre of Paris; and Valli, whose enthusiasm was by no means inferior to these instances, carried from the hospital the seeds of a deadly poison. He retired to his lodgings, declaring that he felt the disease. This was, soon after, evident, and he seemed to be convinced that he should not recover. Pale, feeble and almost lifeless, he could scarcely be heard: "my destiny," said the martyr to zeal—"is irrevocable. I am dying." In vain were all the efforts of skill to save him! He died on the third day, in the 51st year of his age; and thus terminated a life which might have produced the most salutary effects, if it had been prolonged.

THIS STONE

Is consecrated, by the Economical Society of Havanna, to the memory of Dr. Eusebio Valli, who fell a victim to his love of mankind, A. D. 1816.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

Report of the City of London Truss Society, for the Relief of the Ruptured Poor, throughout the Kingdom, Grocers'-hall Court, Poultry.—From the most accurate estimation, it appears, that this malady exists in one person in eight through the whole male population of this kingdom, and in a much greater proportion among the labouring classes of the community, in manufacturing districts, particularly in those persons who are employed in weaving, or on the water as boatmen.

In one district in the western part of England, comprising 200,000 inhabitants, it has been ascertained, by actual observation, that upwards of one in five of the whole population labour under this malady.

Patients relieved by this Society in 1808	227
1809	570
1810	813
1811	1094
1812	1666
1813	1800
1814	2064
1815	2473
1816	2610
	13,317

The following statement of the situation and occurrence of hernia, at different periods of life, has been extracted from the register of the patients relieved by the City of London Truss Society, within the short period of nine years.

In 12,282 cases, 10,121 were males, and 2161 were females.

Males	Females.			
2050	40 left inguinal	5761 inguinal		
3629	42 right inguinal			6621 single.
68	359 left femoral	860 femoral		
76	357 right femoral			
3951	31 double inguinal			
61	243 double femoral			4286 double.
45	472 umbilical			
24	62 ventral			603
	1 perineal			1
	2 obturator			2
18	30 have undergone operations, all except *one* have been completely successful			48
110	111 with umbilical and inguinal hernia have been cured			221
84	19 with prolapsus ani			103
	390 with prolapsus uteri			390
5	2 with varix of the abdominal veins			7
10121	2161	12282		12282

875	patients were relieved with trusses under 10 years of age.
609	ditto, between 10 and 20 ditto.
1219	ditto, 20 and 30 ditto.
2032	ditto, 30 and 40 ditto.
2165	ditto, 40 and 50 ditto.
2160	ditto, 50 and 60 ditto.
1522	ditto, 60 and 70 ditto.
509	ditto, 70 and 80 ditto.
67	ditto, 80 and 90 ditto.
4	ditto, 90 and 100 ditto.
11162	

Six females each had umbilical and double femoral hernia, 2 females had large ventral and double femoral hernia, 5 females had umbilical and ventral hernia, 1 female had ventral and prolapsus uteri, 6 females had umbilical and single femoral hernia, 4 females had right inguinal congenital hernia, 7 fe-

males had left inguinal and right femoral hernia, 1 female had left femoral and right obturator hernia, 4 females had ventral and single femoral hernia, 1 female had double femoral and right inguinal hernia, 6 females had double inguinal and umbilical hernia, 1 female had right inguinal and ventral hernia, 7 females had left inguinal and left femoral hernia.

Twenty-six males each had left femoral and right inguinal hernia, 8 males had left inguinal and left femoral hernia, 21 males had left inguinal and right femoral hernia, 9 males had double inguinal and right femoral hernia, 6 males had double inguinal and left femoral hernia, 4 males had right inguinal and right femoral hernia, 2 males each had double inguinal and double femoral hernia, 6 males had double femoral and right inguinal hernia, 3 males had ventral and right inguinal hernia, 1 male had ventral and right femoral hernia, 2 males had ventral and left inguinal hernia, 1 male had ventral and double inguinal hernia, 1 male had left inguinal, umbilical, and ventral hernia, 1 male had umbilical and left inguinal hernia, 1 male had umbilical and left femoral hernia, 1 male had umbilical and right femoral hernia, 8 males each had umbilical and double inguinal hernia, 2 males had double femoral and right inguinal hernia; 627 patients had congenital hernia, 5 males had very large varicose veins on the abdomen.—*Lond. Med. and Phys. Jour. for March*, 1817.

METEOROLOGICAL OBSERVATIONS.

STATE of the weather at Philadelphia during the first six months of 1817.

JANUARY.

Thermometer—Lowest, at 8 A. M. 19. 20th and 23d days of the month.

Highest, at 3 P. M. 51. 7th.

Mean, ... 30.

The weather uncommonly mild until the 12th—on the 19th the river was frozen at Reedy Island.

FEBRUARY.

Thermometer—Lowest, at 8 A. M. 4. 15th of the month.
Highest, at 3 P. M. 50. 22d.
Mean, ... 25.

Winds—westerly. Heavy snows—which continued on the ground. The winter severe after it commenced in January—as rigorous as it had been known for forty years. A severe storm in Great Britain on the 15th.

MARCH.

Thermometer—Lowest, at 8 A. M. 28. 3d of the month.
Highest, at 3 P. M. 60. 22d.
Mean, ... 35.

Winds—chiefly westerly. The ice in the river gave way on the 10th. Pleasant month—little rain. Spring very early in Europe.

APRIL.

Thermometer—Lowest, at 8 A. M. 40. 19th of the month.
Highest, at 3 P. M. 80. 16th.
Mean, ... 50.

Winds—westerly—a very dry season. The locusts, after an absence of seventeen years, now appeared in abundance. The ice islands were met with in the Atlantic, the beginning of the month.

MAY.

Thermometer—Lowest, at 8 A. M. 50. 30th of the month.
Highest, at 3 P. M. 79. 26th.
Mean, ... 60.

Winds—varying between north-east and north-west. Weather pleasant. Ice in the St. Lawrence at Quebec, broke up on the third of the month.—A severe shock of an earthquake on the 22d, in New England and Nova Scotia.

JUNE.

Thermometer—Lowest, at 8 A. M. 55. 3d of the month.
Highest, at 3 P. M. 85. 14th.
Mean, ... 70.

Westerly winds prevailed. A pleasant month—much refreshing rain with thunder—a severe storm with high wind and hail on the 21st. A very brilliant Meteor was seen on the 24th, about ten o'clock at night, at Philadelphia and New York—its passage was from south to north. Much damage done to the wheat by the Hessian fly in some parts of Maryland and Virginia—and the young indian corn greatly injured in many parts of the United States by a worm—vegetables fine and abundant—and in general very favourable prospects of the grain harvest. In March and April an unusual number of remittent fevers, which generally assumed the typhous character—some small pox continues—no measles—yellow fever prevalent at Havanna in the month of June.

PENNSYLVANIA HOSPITAL.

Patients remaining in the house, April 27, 1816.	188	
Admitted from that time to April 26, 1817.	684	
		872
Of these the number Cured is,	414	
Relieved,	87	
Removed,	71	
Infants born,	11	
Eloped, &c.	38	
Dead,	70	
Remain,	181	
		872
Out patients,		
Cured,	1669	
Relieved,	60	
Disorderly,	12	
Died,	68	
Removed to Hospital and Alms House,	36	
Result unknown,	20	
Remained April 26, 1817,	49	
		1909

College of Physicians of Philadelphia.

JULY 1, 1817.

Officers of the College elected:—

President.

Doctor Adam Kuhn.

Vice President.

Doctor Thomas Parke.

Censors.

Doctor Caspar Wistar,
William Currie,
Samuel P. Griffitts,
Thomas T. Hewson.

Treasurer.

Doctor Thomas C. James.

Secretary.

Doctor Joseph Parrish.

Obituary.

Died in Philadelphia on the seventh day of April, 1817, Doctor JOSEPH WOOLLENS, aged thirty-four years.

—— on the fifth day of July, 1817, Doctor ADAM KUHN, aged seventy-six years.